



Oregon Department
of Agriculture

Invasive Noxious Weed Control Program



2016
Annual Report



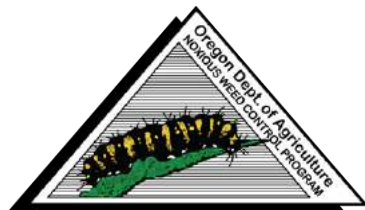
Fletcher's Crossing project area in southeast Oregon where Musk thistle, Scotch thistle, and perennial pepperweed were treated.

Table of Contents

| | |
|---|----|
| Program Overview | 1 |
| 2016 Weed Program Highlights | 2 |
| 2016 Risk Assessment and Noxious Weed List Update | 3 |
| Significant Accomplishments and Special Projects | 17 |
| 2016 Highlights in Biological Control of Weeds | 19 |
| Northwest Region | 21 |
| Southwest Region | 25 |
| US Forest Service Projects | 29 |
| North and South Central Region | 30 |
| Northeast Region | 35 |
| Southeast Region | 45 |



Oregon
Department
of Agriculture



Phone: 503-986-4621

Website: www.oregon.gov/ODA/programs/Weeds

Find this report online:
bit.do/NoxiousWeedAnnualReport

Publication date: April 2017

Introduction

Tim Butler

Manager ODA Invasive Noxious Weed Control Program

During 2016, the Oregon Department of Agriculture's Invasive Noxious Weed Control Program continued to collaborate with cooperators statewide in the implementation of invasive noxious weed control projects in the six regions of Oregon. These projects are being implemented on public and private lands and are comprised of early detection and rapid response (EDRR), containment and integrated control of invasive weed populations protecting our agricultural economy and natural resources. I am extremely proud of our program staff and stakeholders throughout the state who are achieving so much success in the control of invasive noxious weeds with very meager budgets. Examples of efficiencies for the weed control program reveals a 1:34 cost to benefit for EDRR efforts and 1:15 cost to benefit for biological control. These are dollars well spent!

Invasive weed projects are tied directly to strategies identified in the Governor's 10-Year Plan for a Healthy Environment. This includes improving water quality, quantity and fish and wildlife habitat and overall watershed health. As a program we are continuing to refocus priorities for better alignment to support state natural resource polices. There has been a significant investment of funding in salmon and sage grouse restoration, watershed and water quality, and quantity protection in Oregon. Control of noxious invasive weeds is critical to the success of these types of projects, but seldom receive the funding necessary to ensure the success of these natural resource projects.

In June of 2016, Eric Coombs, our Biological Control Entomologist, retired after 29 years of service to the program and a valued member of our team. Through the efforts of Eric and the program staff we had released approximately 77 biocontrol agents on 32 noxious invasive weeds species statewide. It was a distinct pleasure working with Eric for 29 years and he will be missed. I wish him the very best in a much deserved retirement in Utah!

Looking forward to the future, the Invasive Noxious Weed Control Program will continue to evolve as is outlined in our 5-Year Program Strategic Plan. This plan can be implemented with adequate funding and our dedicated program staff and cooperators. I am confident that together we can make progress in protecting Oregon's valued natural resources and agricultural economy.



Noxious Weed Control Program staff (left to right):
Back: Jo Davis, Carri Pirosko, Tristen Berg, Bonnie Rasmussen, Glenn Miller.
Front: Eric Coombs, Tim Butler, Tom Forney, Mark Porter, Mike Crumrine.

Program Overview

Our mission is to protect Oregon's natural resources from the invasion and proliferation of invasive noxious weeds by:

- Providing leadership and coordinating noxious weed management.
- Serving as a technical resource for noxious weed issues.
- Providing public outreach, education, and awareness.
- Conducting weed risk assessments.
- Implementing early detection and rapid response projects for new invaders.
- Coordinating and implementing biological control of weeds.
- Administering the State Weed Board Grant Program.

The program has nine technical staff located in Salem, Eugene, Grants Pass, Redmond, Burns, Enterprise, and Prineville. The program also employs a grant coordinator, clerical, and seasonal staff to help implement projects statewide.

The Noxious Weed Control staff coordinates with private landowners, state and federal land managers, and other cooperators to implement integrated weed management projects throughout Oregon. The program focus is on early detection and rapid response (EDRR) for new invading noxious weeds, implementation of biological control, completion of statewide weed inventory and surveys, technology transfer and noxious weed education, noxious weed data maintenance, weed risk assessment, and maintenance of the State Noxious Weed List. A recent study looks at the economic impacts from a few selected noxious weeds in Oregon and estimates an annual loss of \$83.5 million to the State's economy from just 25 of the 128 invasive noxious weed species.

If left unmanaged, there is a potential loss of \$1.8 billion per year.

The Noxious Weed Control staff works closely with the Oregon State Weed Board (OSWB) to host meetings, provide updates and technical support, and administer the OSWB grants. The OSWB is a seven member board appointed by the ODA Director. The primary mission of the OSWB is to provide oversight for the listing of noxious weeds, guide statewide noxious weed control priorities, and award noxious weed control grants.

Weeds do not respect boundaries and by their nature spread from one ownership to another. To implement an effective weed program, ODA must foster relationships and work with private, federal, state, county, and local interests. Developing and maintaining partnerships is critical to accomplishing our mission. The program works closely with federal partners to develop Memorandum of Understanding (MOU), cooperative agreements, or contracts to facilitate control projects and financially assist the program. About 40 percent of the program's budget comes from federal sources.

Lottery and General funded projects were curtailed to reduce program costs for the biennium. This is reflected in our overall accomplishments including education and outreach, biological control and EDRR activities.

New Employee: Ashley Wagner

Ashley Wagner is the new Program Assistant for the Invasive Noxious Weed Control Program and Insect Pest Prevention and Management Program. A native Oregonian, her roots are in farming across Oregon with a background in natural resources. Ashley attended Oregon State University and was in the Crop and Soil Science Program and the Army Reserve Officer Training Corps. She is an avid fisherman and enjoys hunting, running and camping.



Ashley's catch of the day—two Steelhead at Nestucca.

2016 Weed Program Highlights

- Program staff implemented 85 noxious weed projects, made 544 treatments, completed 93 pre- and post-treatment monitoring activities, and gave 23 presentations.
- Biological agents were released at more than 43 sites. Over 35 biocontrol release sites were monitored to determine establishment and impact.

The ODA biocontrol database contains more than 12,940 records of biocontrol agent releases.

- The OSWB received \$2.5 million for the biennium from the Oregon Watershed Enhancement Board (OWEB). In 2016, 57 grant proposals were received and 50 grants awarded totaling \$1,285,634.57.
- Welled thistle, *Carduus crispus*, first thought to be musk or plumeless thistle, was discovered this summer in Wallowa County. Welled thistle is only known in North America from one other site west of the Rockies in British Columbia.
- Turkish thistle, *Carduus pycnocephalus*, was confirmed in Hells Canyon, Wallowa County. First incorrectly identified as Italian thistle in 2014, genetic testing at Montana State University and subsequent consultation with national thistle experts help to determine the correct identification. The Noxious Weed Program staff is initiating a risk assessment for this plant.
- Several new populations of perennial pepperweed were reported and confirmed in Jackson County. All *Lepidium latifolium* patches in southwest Oregon were treated by Noxious Weed Program staff and partners this season.
- Ravenna Grass, *Saccharum ravennae*, was listed as an A-rated weed in 2015. At the time of listing, the only known site was near McNary Dam in a wildlife area managed by the Army Corps of Engineers. In 2016, monitoring and follow up treatments showed good results from the 2015 treatments. Additional locations were found in Malheur County this field season. Sites will be monitored, as they are ornamental plantings that have not escaped.
- Hoary false alyssum, *Berteroa incana*, was listed as an A-rated weed in 2015. It occurs in two regions of the state; one site in Northeast Oregon near the town of Wallowa and the second site in Central Oregon in the Deschutes County. The Noxious Weed Program surveyed 30 acres and treated 3 acres at the Wallow county site. Deschutes County is treating the Central Oregon locations.
- Flowering rush, *Butomus umbellatus*, continues to be a focus of survey and control on the Columbia River. The Columbia River Flowering Rush Work Group was formed and cooperators from Oregon and Washington are teaming up to work on the issue. Most of the Columbia has been surveyed as of 2016 from McNary Pool west to below Portland. So far it is only found above the John Day Dam.
- Noxious Weed Program and cooperators have made efforts to ramp up detection and control efforts for water primrose, *Ludwigia* spp., on the Willamette River. This species along with flowering

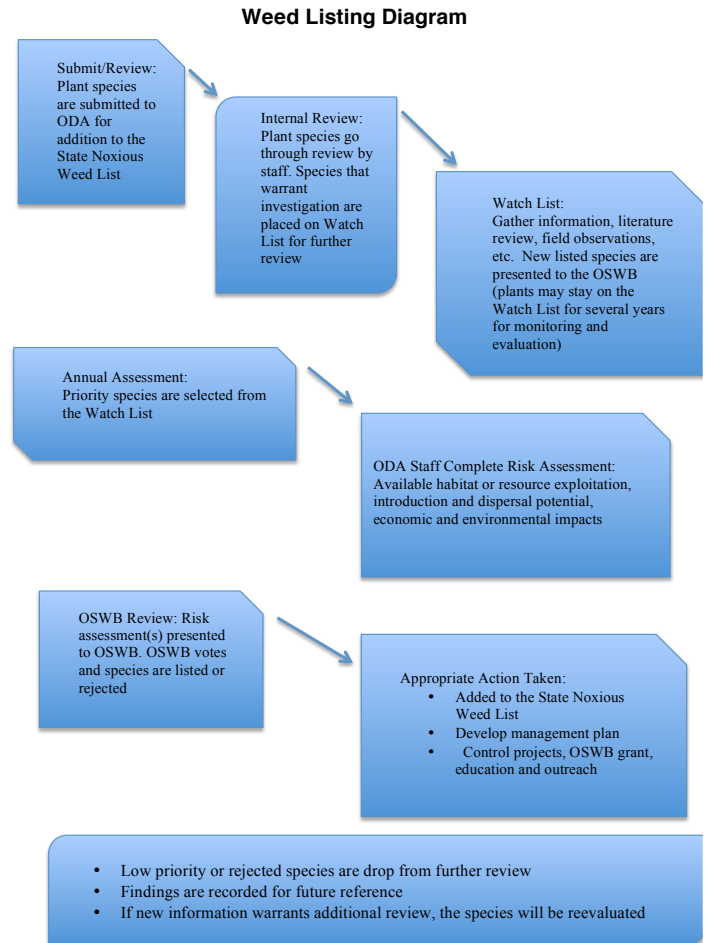
rush have the potential to cause significant impacts to riparian health and water quality.

- Matgrass, *Nardus stricta*, was detected at three new locations in 2015, prompting Noxious Weed Program staff to take action in 2016 to expand efforts for detection and control in coastal counties. In 2015, infestations were confirmed at Cape Blanco airport in Curry County and Devil’s Kitchen State Park in Bandon, Coos County. A third site was also confirmed in Clatsop County on the North Coast Land Conservancy. Previously, matgrass was only known to occur in Klamath County.
- Yellow floating heart, *Nymphoides peltata*, is an invasive aquatic species. Small sites continue to be found in western and central Oregon. Infestations are proving to be difficult to eradicate and are requiring annual treatment. There are 18 locations known in Washington, Lane, Jackson, Douglas, and Deschutes counties. All were monitored and treated in 2016.
- Cordgrass, *Spartina* spp., prevention and control efforts have been very successful at preventing widespread establishment in Oregon’s coastal estuaries. Fewer than a dozen small sites have been found and eradicated since 1999. A new site located near Sand Lake was found and treated in 2014. The site was surveyed in 2016 and no additional plants were found.
- The third phase of the Metolius ribbon grass, *Phalaris arundinacea* var. *picta*, project was conducted downstream of Camp Sherman. This is a cooperative project with the Deschutes National Forest; the project is showing great success in reducing ribbon grass populations with few non-target impacts.
- The Weed Control Program helped align the state noxious weed list with the state weed seed list to achieve greater consistency and for administration of the state seed law.
- A highlight of 2017 was a legislative tour organized by the Columbia River Flowering Rush Working Group partners who led a tour of the McNary Pool and the area near the mouth of the Yakima River to demonstrate the scope and potential impact of the problems that flowering rush might cause.

2016 Risk Assessment and Noxious Weed List Update

The Noxious Weed Control Program develops risk assessments and gathers information to help OSWB maintain and update the State Noxious Weed List. A weed risk assessment process is used to help identify which species are high risk and should be listed. Noxious Weed Program staff prepared draft risk

assessments for delta arrowhead, *Sagittaria platyphylla*, European hawthorn, *Crataegus monogyna*, and South African capeweed, *Arctotheca calendula*. All three species will continue to be evaluated and monitored at this time. More field survey and information is needed to justify the listing of these species.



Steps in the ODA weed listing process

- South African capeweed is found and propagated in California. The south coast of Oregon is a prime habitat for capeweed and with the influx of people moving in from California, it is likely that capeweed is already in Oregon.
- The delta arrowhead is native to the eastern United States primarily in the mid to western Gulf States. All other southeastern states have outlier populations. Its habitat is limited to marshes and shallow water bodies in the western half of Oregon. It occurs in one Oregon location.
- Single-seeded hawthorn is a European tree species, introduced as an ornamental, and occasionally for livestock hedges. Naturalized throughout the west coast of North America, it forms dense thorny thickets in pastures, wildlife areas, and native oak forests. Hawthorn retains

economic value in the nursery trade. It is sold as a hedge plant, as ornamental trees, and has some limited use as a rootstock. In the wild, hawthorn provides a late season food source for songbirds, which in return, aid in the rapid dispersal of the hawthorn seeds.

Noxious Weed Control Grants

The Oregon State Weed Board (OSWB) Grant Program is a partnership with the Oregon Watershed Enhancement Board. Grant funds reside within the OWEB budget and the ODA Noxious Weed Program oversees and administers the grants. The program receives \$2.5 million per biennium to award as grants. There are two grant cycles per biennium and grants are awarded annually. Under the OSWB Grant Program, the ODA Noxious Weed Program staff and the board work to fund as many high-priority projects as possible with the available funds. OSWB grants must meet specific criteria to be funded. Grant dollars were used in project implementation to protect and enhance watersheds, and wildlife habitats from the impacts of invasive noxious weeds. We work with a great group of grantees that work hard around the state to implement their projects. Success of the OSWB Grant Program is due to the great work that is being done on the ground by grantees and through education outreach in their areas.

The Oregon State Weed Board grantees demonstrate good noxious weed control strategies and fiscal responsibility. On average the program has a 52% match rate to dollars funded. In the 2015-2017 biennium, applicants had a success rate of 91%; 99 projects secured full funding, 1 obtained partial funding, and 10 projects did not receive funding. The historic success rate for receiving a grant is about three to one or 68%. The 2015-2017 biennium saw an unusually high rate of success compared to the historic average 68%. In 2016, Noxious Weed Program staff monitored 13 selected grant projects. Grant monitoring is an important component in maintaining communication with grantees, providing technical advice and monitoring progress on the ground.

2016 OSWB Grant Monitoring:

Crooked River Cooperative Weed Management Area

The Scotch Thistle grant was monitored by Tristen Berg, Tim Butler, and Mike Crumrine in September. Debbie Wood led the Scotch thistle monitoring trip showing treated properties. This grant is a great example of a landowner reimbursement/cost share project. Landowners provide the labor and equipment for chemical applications on their own properties. Crooked River CWMA works with local landowners and has signed landowner agreements for noxious weed work. Crooked River CWMA provides the herbicide through grant awarded funds. While out



Crooked River Weed Management Area Scotch thistle monitoring site.

monitoring, a landowner thanked us for funding this grant. The landowner said, without the grant dollars providing the needed resources he would not have been able to treat his property that was heavily infested with Scotch thistle. Crooked River CWMA works closely with landowners through postcards, site visits, surveys, newsletters, and spring training for landowners. Crooked River CWMA works closely to make sure that landowners learn the proper weed identification of plants that are being treated and surveyed for, best timing on treatments and how to calibrate their equipment. This was an exciting project to see landowners having a large involvement and investment in the project and as a result the treated net acres are on a steady decrease for the last three years.

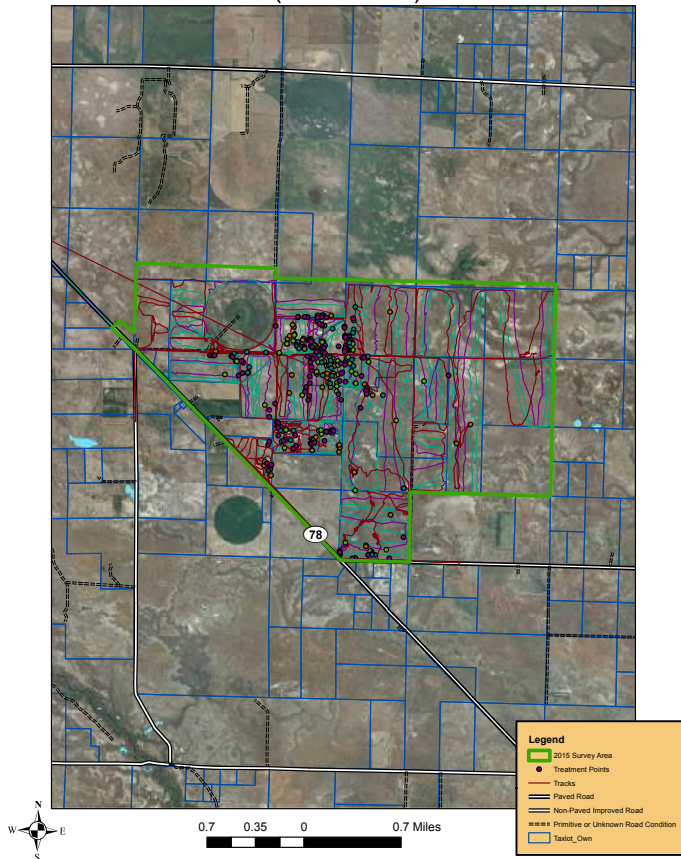


Debbie Wood, with Crooked River Weed Management Area, and local landowner show before-pictures of the property to Noxious Weed Program staff Tim Butler, Mike Crumrine, Tristen Berg (not pictured) and Kev Alexanian with Crook County.

Harney County Weed Board

This African Rue grant was monitored by Bonnie Rasmussen in October. This project is located in a very challenging part of the Harney Valley and restoration

2016 African Rue Treatment Map
(First Round)



2016 African rue survey and treatment map.

is proving a challenge. Once the restoration component is figured out, the longevity of this project will be better understood. Jim Campbell project manager with Harney County has done an outstanding job of controlling this A- listed weed within the project area. Plant numbers continued to decline in net acres infested. Harney County crew covered the project area twice during the treatment window. The grantee worked closely with landowners on monitoring the success of treatments. Photo points were taken and GPS was used for accurate monitoring of previous treatment areas. This project is primarily in a control phase at this time. Some reseeding has been done in an attempt to establish what types of grass may establish in the project area.

Douglas Soil & Water Conservation District

Spurge Laurel and Japanese Knotweed grant was monitored by Carri Pirosko in October. Chrissy Morgan showed sites where fall control of spurge laurel were done by contract crew, Douglas SWCD, and Noxious Weed Program staff (Noxious Weed Program assisted at one site). Considerable direct landowner outreach and education was necessary to obtain permissions for treatment. The fact that spurge laurel is poisonous usually painted a clear picture of



Chrissy Morgan with the Douglas Soil and Water Conservation Program monitors treatment results at Spurge laurel site.

why the project was being conducted and prioritized. Overall, 90-95% of landowner permissions have been granted, leaving a few absentee landowners to locate and gain permission.

Japanese knotweed treatment was delayed to spring 2017, since plants were stressed by late summer heat and die-back happened before the fall treatment window; plants were not actively growing and thus treatment would not have been effective. It is a bit harder to get landowners involved in continued Japanese knotweed control because invasive impacts are harder to see once populations are reduced with initial treatments (year 1-3).

Douglas SWCD does a great job with education outreach to the area with presentations and displays including spurge laurel and Japanese knotweed at annual, winter Douglas County Weed Days, the spring Wildflower Show, and the summer County Fair. The Douglas County Weed Advisory Board is updated at scheduled meetings.

Education and Outreach Activities in 2016 Weed Awareness Week

The Governor declared the week of May 15-21, 2016 to be “Oregon Invasive Weed Awareness Week.” The proclamation by the Governor, combined with education and outreach activities during the designated week, furthers the goal to increase public awareness of the economic and environmental impacts of invasive weeds, which is a key component in protecting Oregon’s natural resources and agricultural economy.

The Weed Wagon Gets a Facelift

The ODA Noxious Weed Program, Deschutes County, and sponsoring partners helped to give the Weed Wagon a needed facelift and update. Deschutes County and Noxious Weed Program worked on a plan to reshape and rename the trailer’s future. It needed



The Noxious Weed Program partnered with Deschutes County to design the new Invasive Species Education Station. Great design by ODA team Tim Butler, Beth Myers-Shenai, Tristen Berg, and Liz Beeles.

repainting and the Deschutes county commissioners suggested selecting a new name since Oregon's marijuana laws had changed. The plan was to have the trailer encompass all invasive species, not just noxious weeds, and be relevant to all 36 counties of the state. A small team was formed to make it happen. Through the graphic design efforts of the Noxious Weed Program a colorful display now wraps the trailer. A picturesque view of the Cascades and Smith Rock, a Central Oregon geologic icon, is the centerpiece. The new name, "Invasive Species Education Station," makes the trailer's function clear to the public. Examples of key invasive species are featured on the sides of the trailer, including Asian Gypsy moth, yellow starthistle, zebra mussel, and spotted knapweed. The invasive species hotline number is displayed, supporting partners are identified, and motorists following the trailer will see a message targeted to outdoor recreationists. Deschutes County provided the trailer for several events; Noxious Weed Program



The English Ivy Forum held in Salem was well attended.

staff showcased and staffed the new Invasive Species Education Station at the Oregon State Fair, Oregon Invasive Species Council (OISC) summit and during legislative days in Salem at the State Capitol to help get out the message.

The English Ivy Forum

The Ivy forum was held on March 29, 2016 and was widely attended. The forum featured a variety of integrated projects and control approaches through presentations and Q&A sessions with speaker panels. Herbicide, manual, cultural and volunteer-based projects were some of the topics.

The Oregon State Fair

From August 26-September 5, 2016, the Noxious Weed Control Program and Insect Pest Prevention & Management Program staff set up a booth within the Natural Resources area at the Oregon State Fair and answered questions from the public on invasive weeds and insects, handed out alerts, brochures, and small outreach items.



(Left) Jason Jaeger, Lake County CWMA, helping with the Play, Clean, Go game at the Oregon State Fair. (Right) Vern Holm, Coordinator of Western Invasives Network, answering questions and helping out at the state fair.

There was a dual focus at the State Fair this year on preventing the spread of invasive plants through recreation and on providing tips for identifying and managing common noxious weeds. Noxious Weed Program staff set up a display showing how weed seeds can stick to gear and clothing and a display of plant specimens so the public could see and touch plants for identification. Hundreds of people went through the booth, resulting in several plant reports and connections to further outreach opportunities. With the focus being on preventing the spread of invasive plants, many kids (and kids at heart) tried their hand at the "Play Clean Go Game". Kids and adults learned different ways that recreating can move or transport noxious weeds and noxious weed seeds. The

public learned the importance of cleaning their hiking boots after a long hike, cleaning off their ATV tires and cleaning their boats before moving on to a new area.

Many thanks to cooperators that helped staff the booth including Jason Jaeger with Lake County CWMA, Melissa Newton with Benton SWCD, Michelle Delepine with West Multnomah SWCD, Anna Freitas with West Multnomah SWCD, Vern Holm with the Western Invasives Network, and Jon Valley with Deschutes County. Special thanks to Deschutes County for lending us the newly designed “Invasive Species Education Station” trailer.

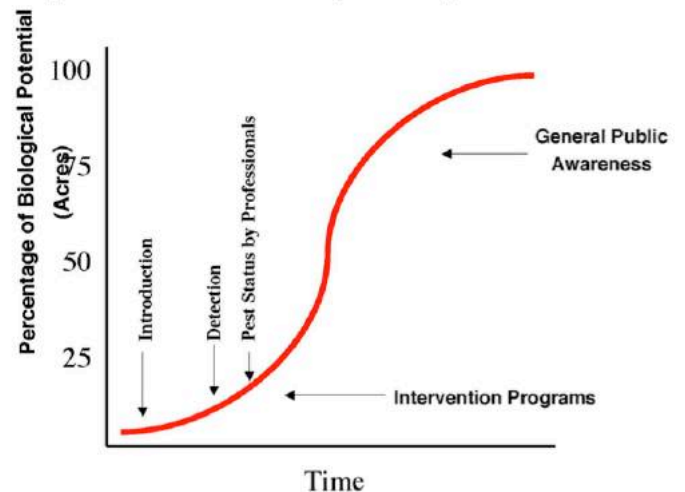
Early Detection and Treatment Activities

Early Detection and Rapid Response (EDRR) is a primary focus of the Weed Control Program. Weeds are listed and targeted for EDRR activities. The goal is to prevent introduction or find new weeds through early detection efforts and implement control measures to limit their widespread occurrence in Oregon.

The Noxious Weed Program accomplishes this through enforcing the noxious weed quarantine and by implementing EDRR projects. A principal activity is using the Weed Risk Assessment process to guide the OSWB on which species to list on the State Noxious Weed List. Priorities listed species, the A-listed weeds and T-listed weeds, are of limited distribution in the state and are the primary EDRR targets for the Noxious Weed Program. Priority species are incorporated into presentation and outreach activities to increase public awareness. Pest alerts and educational materials are distributed in an effort to help locate and report new infestations.

Survey for target weeds is conducted and when they are found, rapid response projects are implemented for eradication or containment. Noxious Weed Program staff work with state and federal cooperators, county weed programs, Cooperative Weed Management Associations (CWMAs), and private landowners to implement EDRR projects and provide assistance through OSWB grants. An economic analysis reveals a 1:34 cost-benefit ratio for EDRR projects. Annual treatments for the control of A- and T-listed weeds have reduced the net acreage of many large infestations of these weeds. For example, annual intensive control efforts for distaff thistle, *Carthamus lanatus*, and purple starthistle, *Centaurea calcitrapa*, have achieved 99 percent control. The Program implemented 63 control projects for 21 A and T-listed species during the 2016 field season.

Early Detection and Rapid Response



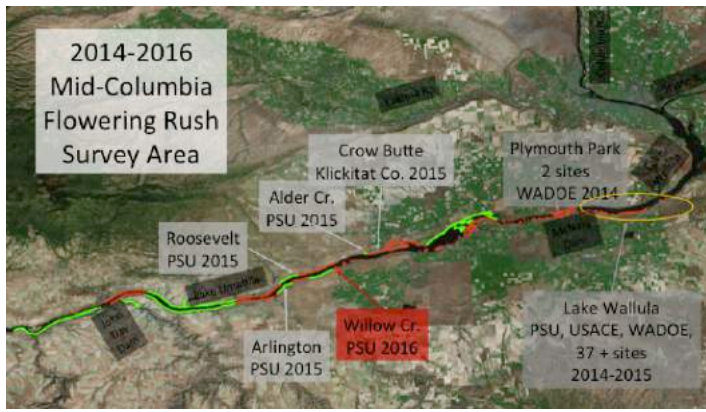
Invasive plant invasion curve.

The following are highlights of A-Listed and T-Designated Weed Projects for 2016:

Flowering Rush, *Butomus umbellatus*

Since 2014, flowering rush has been a high priority for detection and control efforts in Oregon. Several small populations of flowering rush were found in Lake Wallula on the Columbia River in Umatilla County, Oregon in early August 2014. Survey conducted by Portland State University’s Center for Lakes and Reservoirs (PSU) detected the infestations. These were the first known occurrences in Oregon of this A-listed weed. Populations of flowering rush are already known from the Spokane, Yakima, and Pend Oreille, Snake and Flathead Rivers. Before 2014, the furthest known downstream population on the Columbia was at Two Rivers Park in the Tri-Cities. As of 2016, the Oregon section of the Columbia River has been surveyed from the eastern most reaches to below Portland. Flowering rush has been detected in two sections of the Oregon side of the river. The initial finds in Lake Wallula and below McNary Dam in the John Day pool were detected in 2015.

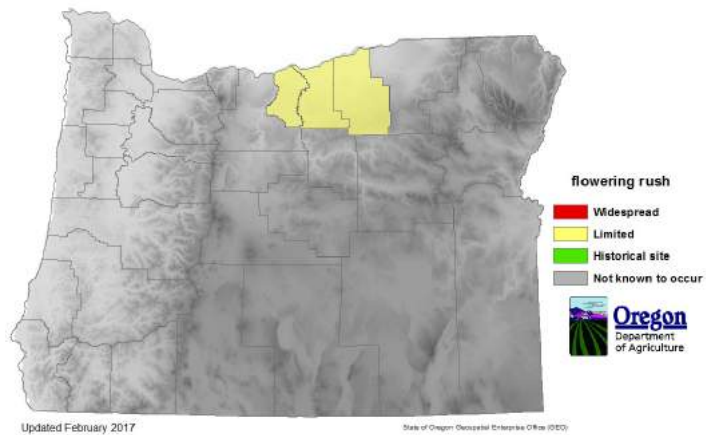
Flowering rush is an escaped aquatic ornamental that invades and dominates shallow slow moving mud bottomed waters. It invades and hampers irrigation systems, endangers salmon migration, alters water quality and precludes recreation. It is difficult to control and aquatic herbicide treatments thus far have not been proven consistent, which complicates the issue. Biocontrol research is underway for flowering rush and is showing promise for the future. However, it will be years before the regulatory process will be completed and biocontrol agents can be released. The strategy at this time is to detect and control populations early and reduce the impact with a long term strategy of finding improved treatment options.



Columbia River Flowering rush survey area.

The preferred treatment option at this time is the diver assisted suction harvest (DASH) system and herbicide control methods.

The Columbia River Flowering Rush Working Group formed following the initial detection in Oregon. The group brings together partners from Oregon and Washington to help facilitate communication, coordination, and treatment of flowering rush on the Columbia system. Key partners include the ODA, Washington Department of Agriculture Noxious Weed Control Program, The Army Corps of Engineers, PSU, US Forest Service Region 6, Oregon Department of State Lands, Oregon Department of Fish and Wildlife, Department of Environmental Quality, and the US Fish and Wildlife Service.



The Oregon State Weed Board funded the initial early detection surveys of the McNary Pool by PSU in 2014. Surveys between Lake Wallula and Juniper Canyon found then six small patches of flowering rush plants. Following the Oregon discovery, Washington State Department of Ecology (WSDOE) also surveyed the northern shore in 2014. Twelve sites were found in all. The Army Corps of Engineers is responsible for the management of these waters and must follow the federal NEPA requirements to actively manage these sites. The NEPA process requires consultation with a number of state and federal agencies and is one of the

primary needs that brought about the Flowering Rush Working Group to help address the issue.

The Walla Walla District of the Army Corps successfully completed the required NEPA documentation and received regulatory approval for manual control treatment in 2015. Manual techniques include the covering and removal of plants by pulling and using a vacuum system to remove the vegetation and fragments. The Army Corps of Engineers provided the first dive team and support crew for the plant removal and covering work in 2015. Noxious Weed Program staff and the Army Corps crew covered half of the sites in 2015 to test the methodology. During the summer of 2015, crews manually treated with the DASH method and covered the treated sites with mats. Monitoring in 2016 showed a 90% control for the treatment made in 2015. In 2016, re-treatment and availability of the DASH diver team was limited due to Army Corps funding.

Additional survey was completed in 2016 by PSU from McNary Pool to below Portland. So far, populations below the Wallula Gap are still small and limited to the pools of the John Day and McNary dams. No sites have been found below the John Day Dam. Survey completed in 2015 below McNary Dam found five sites, making a total of seven sites below McNary. These sites are small and cover less than one tenth of an acre. The sites are under the jurisdiction of the Portland District of the Army Corps of Engineers. The Portland District does not have the required NEPA or consultation in place for treatment. They are currently working to complete the required NEPA documentation. Treatment is dependent on the Portland District's completion of site-specific analysis for the areas below McNary; it is hoped that this will be completed and removal can start in 2017.

Matgrass, *Nardus stricta*

Matgrass is a small perennial bunchgrass native to Eastern Europe. It is unpalatable to grazing animals and therefore can quickly render infested pasturelands unusable. One of the challenges in controlling matgrass is identifying it amongst other native or desirable forage species. Seedlings are small, ranging in size from a dime to a quarter making them hard to find. Seedlings can grow to form circular colonies up to three feet in diameter in a single year. Matgrass was first noticed about 36 years ago in a peat pasture near Fort Klamath. The Klamath site was the only infestation known from Oregon until 2015. Three new sites were detected in Curry, Coos, and Clatsop counties. Impacts to coastal habitats are less well known, but early surveys reveal an aggressive invader that pushes out native flora.

The historic location is a site near Fort Klamath spread over 180 acres of pasture. Control efforts have had mixed success over the past 30 years. Eradication is



Closeup of matgrass.

unlikely, unless the entire pasture is sprayed out and taken out of production for several years to eliminate the seed bank. At this time, the landowner is reluctant to allow such control measures. In 2016, treatment hours for the project were reduced to cut the costs and 0.8 net acres of matgrass were treated over the 180-acre project area.

In July of 2015, an infestation of matgrass was confirmed at Cape Blanco airport in Curry County. Shortly after confirmation, it was also found to infest a small area at Devil's Kitchen State Park in Bandon, Coos County. This new coastal infestation occurs across lands managed by Oregon State Parks. The area, referred to as "Black Lock Point" by locals, is comprised of trails that lead out to a rugged headland just north of Cape Blanco. Botanically, the area is noted for a unique pygmy forest and is one of the few remaining habitats for the federally endangered western bog lily.

In November 2015, the North Coast Land Conservancy (NCLC) via the iMapinvasives database reported a third new matgrass site, located in a coastal prairie. An alert was sent to the database administrator, as this was a new record in Clatsop County for the A-listed Weed. The administrator advised NCLC staff to notify Noxious Weed Program staff and a specimen was subsequently sent to the OSU herbarium for positive identification. Noxious Weed Program staff visited the site containing approximately 100 plants spread over 1000 ft². In 2016, Noxious Weed Program staff assisted the NCLC with treatments. Further surveys and outreach activities are planned for coastal prairie habitats.

Hoary Alyssum, *Berteroa incana*

Hoary alyssum, *Berteroa incana*, a member of the mustard family, is an annual to short-lived perennial forb native to east-central Europe and western Asia. It is an aggressive invader of legume crops and pasture. It is a newly listed A-listed weed in the state of

Oregon. Currently, there are known populations from Willowa and Deschutes Counties. Of these known sites, Deschutes County has located two populations; one east of the town of Sisters and another situated just north of Bend. Deschutes County treated the population near Sisters in 2014. The site north of Bend was treated in 2015 and an expanded area south of the 2015 treatment area was sprayed in 2016. The Willowa County infestation was found near the town of Willowa and is managed by the Noxious Weed Program who surveyed 30 acres and treated 3 acres this season.

Water Primrose, *Ludwigia* spp.

Water primrose impacts water quality, increases sedimentation, and contributes to the loss of important habitat. The Noxious Weed Program's involvement in water primrose treatments on the Willamette branched out from the Delta Ponds and Golden Gardens projects to treatment on the Long Tom River and points north on the Willamette. Control efforts in Lane County are now being coordinated to reduce or eliminate *Ludwigia* from water bodies that flow into the upper Willamette system. Partners include the Benton SWCD, Army Corps Willamette Valley Projects, ODOT, ODFW, City of Eugene Parks, Long Tom Watershed Council, OSP, and Willamette Riverkeeper. Noxious Weed Program staff assisted by providing OSWB grants, with on the ground treatments of the Long Tom, and with a survey covering 18 miles of the main stem Willamette from Albany to just north of the Buena Vista Ferry. *Ludwigia* infestations were identified and recorded to a central database managed by the non-profit group, Willamette Riverkeeper. Many infestations were recorded and survey results will guide future treatment efforts.

Yellowtuft, *Alyssum murale* and *A. corsicum*

Alyssum murale and *A. corsicum* are perennial plants native to Eastern Europe. Yellowtuft are unique in that they can hyper-accumulate metals extracted from the soil in leaf and shoot material. The USDA promoted the use of hyper-accumulating plants in cleaning up contaminated mining soils through a process called phytoremediation. In the 1990s, Viridian LLC proposed the use of *Alyssum* species for phyto-mining, the process of using plants to accumulate and then harvest marketable metal from naturally high mineral (serpentine) soils. *Alyssum* species were planted by Viridian LLC on nine serpentine-rich sites in the Illinois Valley of southwest Oregon. The Viridian planted fields including those on private lands and lands owned by Josephine County and managed by the Illinois Valley Airport. The project failed and *Alyssum* spread from the planted areas and became invasive in the surrounding areas.

The originally planted airport fields are located immediately adjacent to the floristically diverse

Rough and Ready Botanical Area. The Illinois Valley contains the largest concentration of serpentine soils in Oregon and supports a diverse and unique flora. Fifteen plant taxa with conservation status listed as rare, threatened, or endangered by ODA, US Fish and Wildlife Service, or Oregon Natural Heritage Information Center occur in this area, including two species federally listed as endangered. Areas such as Eight Dollar Mountain and Rough and Ready Creek are federally protected as Areas of Critical Environmental Concern (ACEC). There are more State and federally listed “Threatened” and “Endangered” plants on serpentine soils in Oregon than any other soil class. Many of the planted *Alyssum* fields are directly adjacent to these highly valued botanically rich treasures.

In 2005, local citizens and federal land managers reported observing *Alyssum* flowering far from cultivated fields and were becoming skeptical of early assertions regarding the inability of these species to invade the Illinois Valley’s botanically rich serpentine areas. Evaluation and documentation by an interagency task force began in 2005 and continued through 2008. The Noxious Weed Program completed a weed risk assessment that resulted in both species being A-listed weeds by the Oregon State Weed Board in 2009.

In 2016, three new sites in the Caves Highway/Chapman Creek area were detected via helicopter survey. Two sites are on private property and one is on Bureau of Land Management (BLM) land. All three sites were located via ground efforts and treated. A dozen other *Alyssum* plants and patches detected from the helicopter were in already known infestation zones and were treated. Despite above average winter and spring rainfall, germination rates at all originally planted fields continued to decrease. Since treatments began in 2009, this project has achieved a 96% reduction in herbicide applications required to reach annual eradication goals.

A considerable reduction in plants was realized just one year after a sizable new *Alyssum* site was discovered and treated in the Chapman Creek area. The Noxious Weed Program and federal partners cooperatively treated (13.4 gallons compared to 31 gallons in 2015) the site on three separate occasions with many additional surveys.

Populations that escaped planted fields continue to dramatically decrease as well. Noxious Weed Program staff and volunteers pulled only a few dozen plants from an infested section along the Illinois River (Patton Bar to the Second Bridge) compared to hundreds of bags in previous seasons. Numerous volunteer days were organized for locations designated as hand-pull only. An USFS-BLM team conducted manual treatments and survey on federal lands. Funds from both the Rogue-Siskiyou National Forest and the

Medford-Grants Pass BLM Office were critical in allowing the wide scope of work to continue on *Alyssum* this season.

Spartina Survey and Treatment

The state has maintained an excellent track record of finding and treating new infestations of cordgrass, *Spartina* spp. Portland State University Center for Lakes and Reservoirs (PSU) and Noxious Weed Program staff have developed a comprehensive effort to implement regular surveys of thirteen Oregon estuaries that are at high risk of infestation. Three species of *Spartina* have been documented in Oregon. Prior to 2013, only two species, *S. alterniflora* and *S. patens*, were known to occur. The third species of cordgrass, *Spartina densiflora*, was detected in Coos Bay during a 2013 survey. The Coos Bay site was monitored in 2016, no additional plants were found.

Spartina alterniflora was located and removed from a site near Sand Lake in the fall of 2014. The discovery was made by Oregon State Parks and is the first site known from the area. The site was monitored in 2015 and survey of the greater region was completed in 2016. Noxious Weed Program staff conducted surveys by boat and on foot to cover the Sand Lake Estuary. In addition, surveys were completed on the western side of Tillamook and Netarts bays. No additional *Spartina* was found. Estuaries to be surveyed this winter include the Alsea, Siletz, Nehalem, Necanicum, and the eastern parts of Tillamook Bays.

In the Siuslaw watershed, *Spartina patens*, also known as saltmeadow cordgrass, established on Cox Island in the Siuslaw estuary decades ago. In recent years, it has been targeted for eradication by The Nature Conservancy, owners of the property. Some seed production and off site movement has occurred, with several patches forming on two additional islands. Working in this environment is difficult due to tidal



Cox Island, Siuslaw Estuary helicopter survey for *Spartina*.

fluctuations, heavy marsh vegetation, and hidden steep sided gullies. Continued surveys and early treatment is necessary due to the nature of the site. Noxious Weed Program staff monitored 200 gross acres surrounding the island and treated isolated plants. No regrowth was found in these off island sites in 2016.

Purple and Iberian Starthistle, *Centaurea calcitrapa* and *C. iberica*

Purple and Iberian starthistle are two species of limited distribution in Oregon. These species have the potential to invade 1.5 million acres in Oregon, with an estimated economic impact of \$12 million per year. Five historic sites and two active sites have been documented. Prior to the 2009 field season, only a single active purple starthistle site was known from Oregon, located in Clackamas County.

When first found, the Clackamas County infestation was two net acres over 80 gross acres. Since treatment started, there has been a significant drop in plant numbers, indicating that the dormant seed bank is nearing depletion. No plants were found in 2016. In 2009, a new infestation of purple starthistle was discovered in a nine acre pasture just south of Spray, in Wheeler County. Several plants were also discovered in the flood plain of the John Day River. The area was treated within a day of being found. An additional survey was completed involving 4,500 acres. The site was monitored and no plants have been found for the last five seasons. Monitoring will continue for several more years to assure sites are eradicated.

Woolly Distaff Thistle, *Carthamus lanatus*

The Woolly distaff thistle was discovered in Oregon in 1987. This non-native is known to infest vast acreages in California and Australia. Elimination of seed production and seeds banked in the soil is key when battling an annual thistle. The project involves the control, survey, and monitoring of all known infestations of distaff thistle. At a minimum, each site is worked three times each year. Crews apply herbicide with backpack sprayers early in the season prior to setting blooms; manual methods are used later in the season. Noxious Weed Program staff continues to provide supervision and coordination for this project. Since the inception of this project, woolly distaff thistle has been reduced by 99% from historic levels.

This season produced the fewest infested acres of distaff thistle since the project began in the late 1980s. Acres treated totaled a mere 1.23 net acres. Only three sites increased in size due to new thistle patches found near historically infested areas. Helicopter surveys resulted in a new location of a significant distaff thistle population just east of Glide on the Lone Rock Ranch 2014. This site continued to receive extra attention for treatment and monitoring.



Paterson's curse flowers.

Paterson's Curse, *Echium plantagineum*

Paterson's curse is an A-listed weed that threatens Oregon's native habitats with the potential to invade oak woodlands, native prairies, and dry upland slopes. Despite a beautiful appearance, this invasive weed truly is a curse in that it is extremely toxic to livestock. It also infests thousands of acres across Australia. Two counties have infestations, Douglas and Linn, and both sites are under intensive eradication. The two sites continue to see an overall decline.

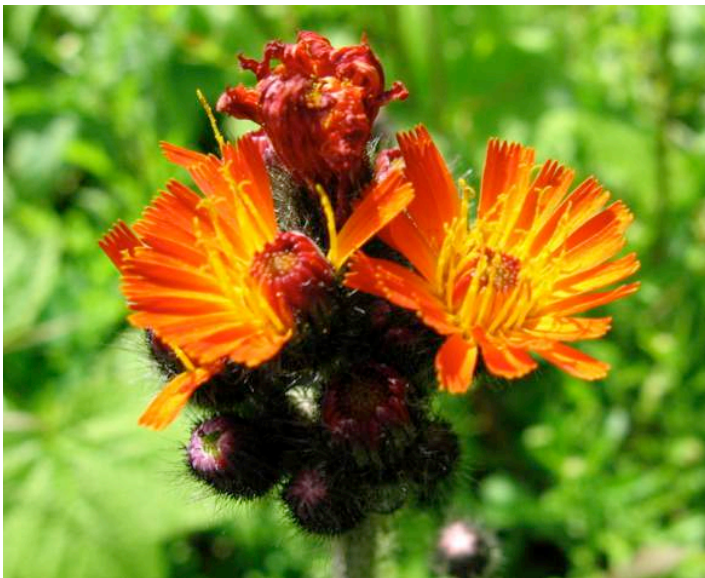
In Linn County, the Lebanon infestation is a fraction of the 2013-14 population levels due to cropping changes in the infested fields and ongoing eradication efforts. Switching to a grass seed crop from flax allowed for greater suppression of broadleaves including Paterson's curse. The few emerged plants were manually controlled in 2016.

The second infestation of Paterson's curse was identified on private lands southeast of Dillard in Douglas County in 2004. Initially 80 net acres of the project area were treated aerially, while the remaining twenty acres were treated with ground equipment. A private contract crew managed under an agreement with Douglas SWCD has worked the 300 acre gross area using backpack sprayers since 2008. This season saw another drop in the numbers of Paterson's curse plants detected and treated. The number of plants detected spiked in 2013 at 13 net acres. An impressive 65% decrease in Paterson's curse plants was achieved between 2014 and 2015. Net Acres detected and treated this season decreased to 1.2 acres compared to 4.2 acres in 2015.

Orange, Yellow, and Meadow hawkweed, *Pilosella aurantiacum*, *P. pratense*, and *P. caespitosum*

Hawkweeds are highly invasive members of the aster family. Once established, hawkweed can quickly develop patches that expand until they cover an area and form a solid mat of rosettes. Hawkweeds displace natives, posing a serious threat to native plant communities. They can also dominate pastures, lawns, and roadsides, crowding out desirable species.

Hawkweeds are invading native meadows on the Mt. Hood National Forest (NF). Additional populations occur in Wallowa, Union, Deschutes, Klamath, and Harney counties. Overall, orange and yellow hawkweeds continue to be found at new locations in central and eastern Oregon. So far, most of the new finds on the national forests and on private timberlands are manageable. A concern is the increasing number of new orange hawkweed sites occurring in Deschutes County in urban areas where management in lawns and landscapes is difficult. It is an attractive plant and is used as an ornamental. Awareness and outreach activities have helped to increase the reporting of new sites, but the number of new site continues to increase.



Orange hawkweed flowers.

The Mt. Hood NF infestation covers over 1,000 gross acres of Lolo Pass on the Zig Zag and Hood River ranger districts. The majority of the infestation is found on Bonneville Power Administration (BPA) managed rights-of-way and additional outlier sites are found in the Mt. Hood Wilderness, along county roads, and on private timberland. Treatments have achieved 95% reduction since 2003. In 2010, the population rebounded following several of years of low plant numbers. The following field season has shown good results and recent treatments are keeping the infestation in check. For the last two years,

Noxious Weed Program staff has partnered with Clackamas SWCD crews to more effectively cover the site. Private timberland in the area north of the Lolo infestation had an increase in plants numbers and received additional survey and treatment in 2016.

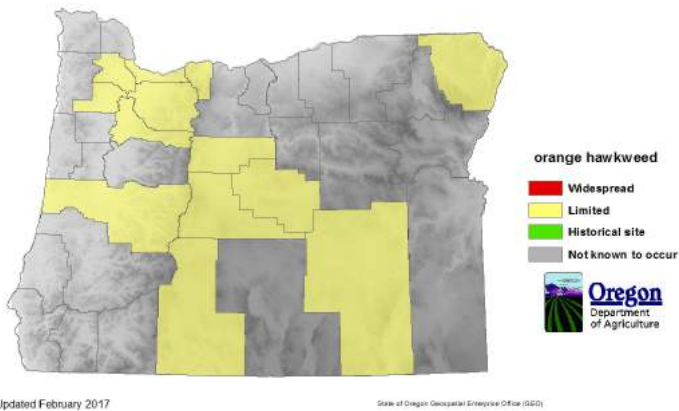
In addition to the work on the Mt. Hood NF, there is a small patch along highway 22 in the Willamette NF where a few plants appeared this year; they were hand pulled by the district botanist. There are also scattered locations of orange hawkweed in the Portland area, many of them intentionally planted as ornamentals, often dispersed through plant trading. City of Portland staff monitor these, offering assistance to residents to treat them as needed and reporting site status to the Noxious Weed Program.

Central Oregon populations of orange hawkweed continue to be a challenge. While infestations on private timberlands and on the nation forest are being kept in check, populations in the urban locations have been difficult to get under control. In 2005, the first populations were found in central Oregon in the landscape of the city of Sisters. As a result of this find and press coverage, 16 confirmed locations were found in Deschutes County. Plants were determined to be from a nursery that was selling orange hawkweed as “orange aster.” Since the original finds in 2005, new populations continue to be found and treated throughout central Oregon in yards and landscapes. The Deschutes NF completed an environmental impact survey (EIS) in 2005 to address the infestations on the national forest lands. New and persistent sites on the National Forests are being treated annually.

Treatment strategies shifted for 2014 with Deschutes County. Funded by an OSWB grant, the county offered a cost share to residential private landowners. Treatments were also conducted on public and private lands by Noxious Weed Program staff at several sites throughout Deschutes County. The same program continued with Deschutes County providing herbicide and equipment for those landowners affected by orange hawkweed during the 2016 season.

A single population of orange hawkweed exists in Crook County. This single property in Prineville is the only known orange hawkweed site within Crook County. Both Noxious Weed Program and Crook County staff made multiple treatments.

In 2009, the first two small sites were found in Klamath County. One site of 30 plants was found in northern Klamath County on USFS land, and the other site was in a residential yard in Klamath Falls. The USFS site was pulled and bagged by USFS crews. Noxious Weed Program staff chemically treated the residential yard. In 2010, the Klamath County Weed Department found several additional sites in the towns of Chemult and Crescent. In 2012, a new large site was found in the landscape of a retirement home



in Chiloquin. Noxious Weed Program and Klamath County worked with the maintenance manager to develop a treatment plan for the facility. The sites were monitored and treated in 2016.

Northeastern Oregon meadow hawkweed sites are a cooperative focus of state, county, and federal agencies all working to control meadow hawkweed in Wallowa and Union counties. Acres treated have remained relatively constant for the last several years. Effectiveness monitoring showed that treatments seemed to be working very well but new infestations continue to be found. The extensive cooperative effort in the region, good mapping, data management, and communication make this project worthwhile and sustainable. Noxious Weed Program staff helped in this cooperative effort through survey and treatment with partners from Wallowa County, Tri-County CWMA, the Canyonlands Partnership, and the Umatilla and Wallowa Whitman National Forests.

Union County treatment efforts were focused on outlying populations but especially on Looking Glass and Phillip's Creeks near Elgin. In addition, Noxious Weed Program staff worked with the Tri-County CWMA to delimit and treat an outlying hawkweed site on the North side of the Grande Ronde Valley under the shoulder of Mount Emily. The site had gone untreated for at least 3 years during staff transitions at both agencies. What had been a small infestation including just a few small sites now has become a multi-property area that required several days to treat. More survey work is needed at the south end of the area where there are many property owners. Personnel resources were overwhelmed during the prime treatment windows and therefore the Cricket Flat population of meadow hawkweed was not treated but the Mount Harris area was covered intensively. It may be that without an increase in funding and/or labor resources these areas may only be treated on alternate years.

In Wallowa County, efforts focused on new inventory and treatment in the upper Wallowa Valley and on controlling infestations in the riparian areas of the Grande Ronde and Joseph Creek Watersheds. The

Wallowa Whitman National Forest finally prevailed in a longstanding court case that had limited what weed sites they could treat and the herbicides they could spray. This year, they were able to treat many sites that had not been treated for years. Sites near the Hat Point area and the upper Imnaha Watershed were given the highest priority. The Wallowa Canyonlands Partnership focused on outlying sites as top priority. Small hawkweed populations in the North end of Wallowa County near the town of Troy on the Grande Ronde and Wenaha Rivers where the Grizzly Fire devastated much of the country in 2015 received special attention. Orange hawkweed was found in 2006 in the City of Hines, Harney County. Noxious Weed Program staff started treatments at three residences in 2007. Occasionally plants reoccur, sites are monitored and treated as needed by Noxious Weed Program or the county weed crews.

Barbed Goatgrass, *Aegilops triuncialis*

Barbed goatgrass, an A-listed weed, was detected in 2003 along Hwy 199 near Rough and Ready Creek, south of Cave Junction in Josephine County. While infested acres of barbed goatgrass are increasing in California, this is the only known population in Oregon. Three volunteer sweeps were made across the area to manually remove and bag plants; one bag was taken off site and destroyed compared to four bags in 2015. The infestation zone extends across private, state, and federal boundaries. No new sites were found this season. Support from both the Rogue-Siskiyou National Forest and the Medford-Grants Pass BLM Office lend to the ongoing success of this eradication project.



Barbed goatgrass.

Yellow Floating Heart, *Nymphoides peltata*

Yellow floating heart, an escaped ornamental aquatic plant, was first reported in 2004 from Washington County, Oregon. As of this field season, 18 sites have been documented and are undergoing treatment. Sites are found throughout western Oregon and as of 2014 east of the Cascades at eight sites in Deschutes



Yellow floating heart in Douglas County.

County. The Deschutes infestations more than doubled the number of known sites in Oregon.

Five yellow floating heart infested bodies of water are known to exist in southwestern Oregon. No newly infested ponds were detected in 2016. In Jackson County, over the past five years, the Rogue River-Siskiyou NF has nearly eradicated an infestation at Little Squaw Lake. In 2016, only a few small plant fragments were detected. Persistence, bottom barriers, and divers have proven instrumental in this effort. In Douglas County, two private ponds near Kellogg and two ponds at a golf course in Roseburg were surveyed and treated in the spring, summer, and fall. Not a single plant was found in the golf course ponds this season. Continued reduction in plant density was achieved at both Kellogg ponds. After one year of treatment, an estimated 90-95% reduction of plant density was realized in a fire pond in the Umpqua National Forest. This season, Noxious Weed Program staff conducted late summer treatments targeting remaining pockets of yellow floating heart.

A significant reduction in plant density was realized at all four ponds. Imazamox was used this season compared to glyphosate and imazapyr in 2014. An infested fire pond on the Umpqua National Forest was brought to the Noxious Weed Program's attention in 2013. A letter from the State Weed Board was sent to the Umpqua Forest Supervisor to encourage prioritization of this A-listed weed needed NEPA site analysis. The completion of an EIS in 2015 finally allowed treatment of an infested fire pond. Noxious Weed Program staff conducted two fall treatments and monitoring photo points were established.

In September 2013, a report came in that a stock pond near Redmond contained yellow floating heart. Investigation, image analysis, and reports from the general public after radio and newspaper articles have turned up a total of eight infested ponds and water features within Deschutes County. All of the newly discovered sites were treated by Noxious Weed

Program staff. The 2013 treatments had varying success believed to be largely tied to the factor of their discovery and treatment late in the fall. For 2014, treatments continued on the eight original sites and three additional sites were found and treated in July. Treatments are providing season long control, but are proving to obtain a mixed result the following year. Some sites show noticeable improvement, while some appeared to have no effect from the prior year's treatments. One site was covered in 2016 with a bottom barrier as an attempt to smother the persistent plants.

Multiple new sites were detected on the Willamette River in 2016. The point source for these infestations may be near Eugene at a golf course. Further surveys are planned to identify the source. Noxious Weed Program staff conducted treatment of a large site on a side channel of the Willamette with the assistance of State Parks personnel and their jet boat. Other sites have been detected, which are smaller and were hand pulled by cooperators. Staff worked with the homeowners association at Horseshoe Lake near Albany to develop a long-term strategy to rid the lake of floating heart. Current glyphosate or imazapyr treatments have limited effect.

Giant Hogweed, *Heracleum mantegazzianum*

In 2015, Noxious Weed Program staff worked with City of Portland, Clackamas SWCD, Columbia SWCD, Clatsop SWCD, Tualatin SWCD, Tillamook SWCD and Hood River SWCD to monitor and/or treat all known locations of giant hogweed in Oregon. Through outreach and survey efforts, a small number of new sites in Portland were located and work is underway to secure permission from property owners to ensure they are treated. Most sites are in current or former residential landscape settings.

Fanno Creek and Vermont Creek, both in the Portland Metro area are the two known riparian infestations of giant hogweed in the state. No plants were found along Vermont Creek this year, and over 40% of the 125 previously recorded patches along Fanno Creek had no observable plants.

Work is currently underway to update and analyze the giant hogweed database. Fifty-two of the initial 193 sites have been considered eradicated, 12 of them were given that status this year alone. Twenty additional locations have had no plants recorded for 4 years. These will be added to the eradicated list pending monitoring for no occurrences next year. As database analysis continues, sites that are considered eradicated will likely increase. Overall, active giant hogweed sites and plant numbers have dropped significantly since it was first discovered in Oregon in 2001.



Oblong spurge in Salem.

Oblong Spurge, *Euphorbia oblongata*

There was a resurgence of oblong spurge at Oregon's largest site, located in Salem. Oblong spurge is believed to have been introduced as a contaminant in flax seed that was grown and processed at the location in the mid 1900's. The core infestation is at the Oregon Office of Emergency Management where it lines the south shore of a pond. It has also moved off site along a drainage ditch to the adjacent Oregon State Penitentiary property along Mill Creek. Noxious Weed Program staff treated all known locations with imazapyr herbicide. Monitoring of sites this year showed minor regrowth following the 2015 increase.

There are also scattered locations in the Portland Metro area that City of Portland and Clackamas SWCD staff are monitoring, treating, and reporting to Noxious Weed Program staff. It is not entirely clear how many of these urban locations originated, but some of them may have been planted as ornamentals.

Plumeless thistle, *Carduus acanthoides*

Plumeless thistle is known from three counties in Oregon, Klamath, Grant and Wallowa counties. The Klamath County weed supervisor first discovered plumeless thistle, *Carduus acanthoides*, near Klamath Falls in 2007, at the Miller Island Waterfowl Refuge. Plumeless thistle was only previously known from one site in Grant County. In 2008, the Klamath County weed supervisor found another small site in a new subdivision being built just west of Klamath Falls. The Miller Island site was about one acre scattered over five acres and the subdivision site contained 24 plants. In 2012, Klamath County Weed Department treated all the sites. The County and Noxious Weed Program staff surveyed the surrounding 500 acres, finding no additional plants. These sites have been monitored and treated for several years.

Grant County contains the original plumeless thistle sites, discovered about 20 years ago. It is managed very aggressively each year to reduce plant density for containment. Recent increases in landowner cooperation have allowed for the discovery and treatment of several new sites. Grant Weed Control intensively manages those sites each year with help from OSWB funding. In 2016, less than 0.01 net acres were treated this year versus 20 acres in 2015.

Several plumeless thistle sites were discovered in Wallowa County four years ago. Noxious Weed Program staff is treating the sites; most were down to less than five plants this year. Some of these infestations are in immediate proximity to Spalding's Silene, *Silene spaldingii*, an endangered plant. Treatment of this weed is important to general rangeland health and agricultural production but also to prevent any threat it may pose to this endangered plant and the area's native grasslands.



Plumeless thistle flowers.

Taurian Thistle, *Onopordum tauricum*

Taurian thistle, *Onopordum tauricum*, is a sister plant species to Scotch thistle, *Onopordum acanthium*, and has the same potential to be invasive. In Europe, it is more aggressive than Scotch thistle. Taurian thistle is lime green with large baseball-sized terminal flower heads that resemble an artichoke.

The first Oregon infestation was discovered in Klamath County in 2007. The Noxious Weed Program and the Klamath County Weed Program have treated and monitored the site for the last five years. Two new sites were found in 2012, located west of Klamath

Falls on Hwy 140. Both sites totaled 200 plants and covered one net acre. The Noxious Weed Program and Klamath County continue to monitor and treat the sites several times a year.

Squarrose Knapweed, *Centaurea virgate*

Squarrose knapweed is an A-listed weed in Oregon. Presently, one site is under treatment in Grant County and a second in Jefferson County. A historic site in Malheur County continues to be monitored and no plants have been found since 2003. The Grant County site has been under intensive treatment since its discovery in the early 1980s. Grant County manages the project with the Noxious Weed Program's assistance through an OSWB grant. The Noxious Weed Program continues to help with the project and monitors treatment to ensure effective control. The original project area covered a gross 3200 acres. Over the past 20 years, the infestation has been reduced by 99% to less than 1.25 acre spread over 140 acres.

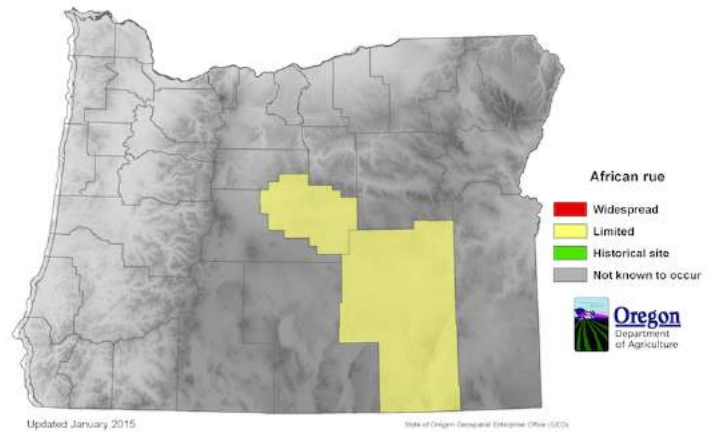
In 2003, Jefferson County Weed Control noticed that the plants that were being treated were not diffuse knapweed as believed, but squarrose knapweed. OSU herbarium staff confirmed the identification. This population of squarrose knapweed has not produced seed since 2003. At times plants are found, but with both Jefferson County and Noxious Weed Program watching this site these plants have not seeded since this location was found. Noxious Weed Program staff plans to periodically monitor the site, but no plants were found in 2016.

African Rue, *Peganum harmala*

The first report of African rue in Oregon was a mystery. An OSU herbarium specimen was recorded in the mid-1960's from Crook County, but did not mention a specific location. A member of the Native Plant Society located the site in 1991. African rue has been treated as an A-listed weed by the Noxious Weed Program and Crook County since the rediscovery.

The Crook County infestation is along Highway 27 and occurs on both public and private lands. The main portion of the infestation is on BLM land, which provides most of the funding for control. Crook County and the Noxious Weed Program are working together to treat the site. The roadways leading into and out of the control area and the surrounding rangeland are being surveyed yearly. The population has remained static since 2013 and requires annual treatments to maintain control. Crook County completed the control work in 2016; new plants and regrowth continue to be found. The roadways leading into and out of the control area and the surrounding rangeland are surveyed yearly and treated.

In early September 2008, a contractor for the Bureau of Indian Affairs noted a possible infestation of African



rue on tribal allotments located in the Harney Basin southeast of Burns. The Noxious Weed Program verified the plant as African rue. The initial response plan was to treat outlier sites, roadsides, barnyards, and pivots for containment and to prevent further spread. In 2008, the Noxious Weed Program spent several weeks doing the initial site delimitation, which revealed a project area of 2,700 gross acres and 19 landowners including Department of State Lands, private, and tribal lands. An African Rue Cooperative Weed Management Plan was completed in 2009. This project is now largely funded by an Oregon State Weed Board Grant to Harney County and is monitored by Noxious Weed Program staff.

The Harney County weed program modified their treatment approach for 2016, after monitoring revealed skips and missed plants in 2015. Three rounds of treatments were planned for this season; an early initial pass with a large crew including five ATVs was implemented to improve coverage of the area. A second pass was made two weeks later by a smaller crew performing survey and treatment to catch plants that were either missed or that had not germinated. After completing the first two rounds of treatments, a third pass later in the season resulted in the finding and treating an additional half of an acre. Overall, the total population of African rue was down 8.5 acres from 2015 treatments.

Significant Accomplishments and Special Projects

Noxious Weed Program 5-Year Strategic Plan

The Noxious Weed Control Program developed a 5-year plan to provide a stronger statewide presence that fully utilizes the Program staff's unique skills and experience. The Program's 5-year plan focuses on invasive weed priorities and emerging needs to serve the state, federal, county, local, and private land managers. In order to do this, it will require shifting away from dependence on inflexible funding sources to those that allow for priority-driven management that will best protect Oregon's natural resources.



The 5-year plan will align the Program with priority policies of the state, support local service, and provide funding of county weed programs through ORS 569-520. It will expand county and local roles by moving some current Noxious Weed Program activities to the counties. Noxious Weed Program staff will focus on grants, consulting, education and outreach, EDRR, terrestrial projects, riparian/aquatic projects, technical services, and data management.

The new goal of the ODA Invasive Noxious Weed Control Program is to provide leadership, communication, and capacity for technical support to stakeholders for invasive weed management, and have the staff and equipment infrastructure in place regionally to both coordinate and implement invasive weed management projects. These projects are directly tied to natural resource management strategies at federal, state, county, and local levels.

Weed Funding Concept

Considerable time was put into planning, meetings and providing information to special interest groups to help support the development of a funding source for the county weed funding bill (HB 3358) that was passed by the Legislature in 2011. This bill provided authority for ODA to adopt administrative rules to administer a grant program to counties for the control of noxious weeds through funding support of county weed control districts (ORS 569.520).

To qualify for funding, a county must be designated as a county weed control district as defined under ORS 569.360-495 and comply with the administrative rules that are established for carrying out the grant program. The bill also requires that priority funding be given to noxious weed control projects that restore, enhance, or protect water quality, watersheds and

habitats. For accountability, the counties also must report to the Noxious Weed Program on the use of grant funding.

Biological Control White Paper

Tim Butler, Eric Coombs, and Carri Piroosko prepared and presented a white paper to USDA-APHIS. The focus of the paper was to review and bring to light some of the issues and trends surrounding the approval and release of new biological control agents. The white paper explained that the Technical Advisory Group (TAG) procedure is a rigorous evaluation and approval process. It started in 1987 with scientists from 15 agencies representing US, Canada, and Mexico. Worldwide there are 224 invasive plant species targeted by 551 biocontrol agents. In the US, there are 43 plant species targeted with 118 biocontrol agents. A lawsuit against the Saltcedar biocontrol program resulted in APHIS halting all the biocontrol petitions creating a clogged pipeline when it comes to releasing new biocontrol agents for noxious weeds. From 2000-2009, only 22 biocontrol agents were released in the US, a 39% reduction compared to the previous two decades. Since 2010, there were no permits released. Currently, there are 10 TAG-approved petitions waiting for APHIS' approval.



The pipeline process to make new biological control agents available is plugged!

To re-open the clogged pipeline, people have to work internally with APHIS by submitting letters, addressing the issues in meetings, summit and conferences; address delays and extra research requests during the USFS Environmental Assessment (EA) review by setting 90-day deadline and designate a TAG representative as final approval agent; and seek Congressional evaluation of the issue through a Program Review.

Flowering Rush Legislative Tour

The Columbia River Flowering Rush Working Group led a tour of the McNary Pool and the more heavily infested areas near the mouth of the Yakima River to demonstrate the scope and potential impact of flowering rush. Participants included State Senator Hansell of Oregon and his staff, as well as staff from

2016 Highlights in Biological Control of Weeds

Classical biological control is the purposeful introduction of selected natural enemies with the goal to reduce the population of targeted exotic noxious weeds.

Since 1947, there have been 77 species of classical biological control agents introduced against 27 species of noxious weeds in Oregon. Several of these biocontrol agents have become reassociated with five additional species of weeds for which they were not originally introduced (for a total of 32 weeds). The Noxious Weed Program manages over 120 biocontrol projects (weed/agent combinations). The Noxious Weed Program houses the state's biocontrol database that contains more than 13,010 records of biocontrol agent releases, nearly 90% of releases made in Oregon.

Several biocontrol projects in Oregon have been successful in controlling targeted invasive weeds, including tansy ragwort, St. Johnswort, musk thistle, Mediterranean sage, purple loosestrife, yellow starthistle, Dalmatian toadflax, and diffuse knapweed; especially at sites that are managed to improve competitive native vegetation. The Program strives to adhere to the International Code of Best Practices for Classical Biological Control of Weeds in order to implement a safer and more effective biocontrol program. Our goal is to protect our natural resources by managing approved biocontrol agents, redistribute them to major infestations of the target noxious weed, and monitor their impacts on the target species. There are 1,512 weed/agent/county combinations. This means that for each infested county, the total number of weeds targeted for biological control, plus the number of biocontrol agents. Keeping track of all this information is a daunting task. Our goal is to get all approved biocontrol agents as widely distributed in as short of a time as possible. At the end of 2016, the percentage of established biocontrol agents that are widespread on their target weeds by county is 41%.

Classical biological control of invasive noxious weeds has a good safety record, but a somewhat scanty track record of documented economic benefits. Most of the funding for biocontrol projects is utilized during the foreign exploration, host specificity testing, and introduction phases, with little funding appropriated for long-term efficacy studies. Because biological control is a public good, it is best coordinated by public agencies, as it would be impossible for private enterprise to recuperate the development costs of each project. The average upfront cost per release for the Noxious Weed Program is about \$500. Reported cost-benefit ratios (dollars spent vs dollars saved) from around the world vary from 1:112 to 1:2. For example, biocontrol of tansy ragwort in Oregon yielded an

85% internal rate of return and a 1:15 cost-benefit ratio. On successful long-term projects, benefits can occur as steady stream returns, i.e., \$5 million/ year for the ragwort project in Oregon, where annual agency expenditures on this weed is now less than \$20,000 per year. Where feasible, it is economically advantageous to implement biocontrol in order to reduce annual losses. By actively redistributing ragwort biocontrol agents, the Noxious Weed Program accomplished a successful regional project 5-10 years sooner than by the natural spread of the insects, thus averting \$25-\$50 million in losses to our agriculture industry.

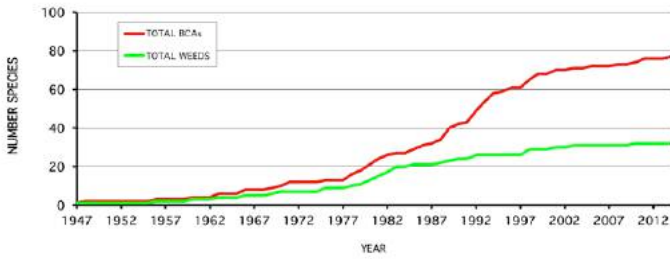
A partially successful biocontrol project, i.e., one that reduces weed infestations by variable percentages over large areas, can provide a positive cost-benefit ratio, even though the degree of weed control may be less than desired. If biocontrol in Oregon would reduce just the top 12 weeds by 30%, annual losses could decrease by \$20 million. A 10% reduction of Scotch broom alone by biocontrol agents would yield \$1.5 million in annual benefits to private and public landowners. An estimate of the net economic benefit of biocontrol agents in Oregon is valued at \$12 million/ year.

Significant Accomplishments for 2016

Eric Coombs, the Noxious Weed Program's longstanding biocontrol entomologist retired this summer after 29 years of outstanding service to the ODA and Oregon. His work spanned four decades and has contributed greatly to Oregon's standing as a world leader in biological control of invasive noxious weeds. The Noxious Weed Program has released more species of biocontrol agents than any other state program and the number exceeds that of most countries.

As a cost saving measure, this position was not filled for most of the 2016 field season. Biocontrol work for this year was reduced by about half due to Eric's retirement. Hopes are to fill this position in the future. The Noxious Weed Program continued to move forward on the biocontrol front working with our partners to fill in the gaps. Noxious Weed Program regional staff continued their effort to collect, monitor and distribute agents and Colin Park, APHIS-PPQ Portland, assisted greatly with this year's efforts to keep projects moving forward.

This season, 9 species of biocontrol agent (over 95,000 biocontrol agents) were released against 6 species of targeted invasive weeds at more than 43 sites, resulting in a treatment of more than 215 acres. Over 35 biocontrol sites were monitored to determine establishment and impact of biocontrol agents. Releases of biocontrol agents were provided to cooperators in Oregon and neighboring states.



Cumulative number of invasive weeds (27) targeted (green) and cumulative number of classical biological control agents (77) [BCAs] (red) released in Oregon by year.

The United States Department of Agriculture Animal Plant Health Inspection Service Plant Protection and Quarantine branch (USDA-APHIS-PPQ) biocontrol program remains a very important partner in implementing biocontrol in Oregon. Regional Noxious Weed Program staff and APHIS provide surplus biocontrol agents to many local agencies and other states. In 2016, Noxious Weed Program and APHIS staff and other cooperators provided over 95,000 biocontrol agents (43 releases) to county weed programs, other agencies, and states. The Noxious Weed Program continues cooperative research projects with Drs. Peter McEvoy, Fritzi Grevstad, Ed Peachy, and their staff at Oregon State University (OSU). Noxious Weed Program is also a partner with Dr. Fritzi Grevstad, at the OSU Forestry Sciences Quarantine Laboratory, where we have been working on cooperative projects on the biological control of knotweeds and gorse.

Field Bindweed

A cooperative research project is being conducted in conjunction with Dr. Ed Peachy and Jessica Green (OSU) to determine the distribution of the gall mite and the field bindweed moth, *Tyta luctuosa*, in western Oregon. The flight season of the moth was studied at the Baskett Slough National Wildlife Refuge in Polk County. The flight season begins in May and extends into September, with two peak periods. Additional monitoring did not reveal establishment at any of the release sites in Eastern Oregon.

Gorse

In 2008, testing of the gorse shoot moth, *Agonopterix ulicitella*, and the gorse thrips, *Sericothrips staphylinus*, began at the OSU Quarantine. Insects were collected near Hilo, HI and brought to Oregon. The project is being coordinated by Dr. Fritzi Grevstad, OSU, and primarily funded by the US Forest Service (USFS). A petition for field release of the gorse thrips was submitted in 2012, and pre-release studies conducted along the SW Coast. We are hoping for a 2017 field release, as the Technical Advisory Group (TAG) approved its release to APHIS and we are awaiting the final Environmental Assessment.

Japanese Knotweed

Host specificity tests at the OSU Quarantine Lab by Dr. Fritzi Grevstad were finalized and a petition for field release of the plant sucking psyllid, *Aphalara itadori*, was submitted to TAG. More testing is required on the southern strain, however the northern strain was approved by TAG. Pending approval by USDA-APHIS, releases could be made in 2017.

Russian Knapweed

The gall midge, *Jaapiella ivannikovi*, was extensively collected and redistributed throughout Oregon from the McNabb Road site in the Willow Creek area in Morrow County in cooperation with USDA-APHIS. An extensive redistribution program was conducted in 2015 and 2016, which provided 57 releases throughout infested areas in Oregon. This is the first wasp used as a biocontrol agent in the US.

Yellow Starthistle

In 2014, the rust fungus, *Puccinia jacea* var. *solstitialis*, was recovered for the first time in Oregon in the Myrtle Creek area in Douglas County. A cooperative study on its impact and distribution was conducted in 2015 with Dr. Bill Bruckart, USDA-ARS. The rust was confirmed to be established and it had spread nearly three miles from the original release site as of 2016. Results were published in the Plant Disease Journal.

USDA-ARS Blackberry Rust Study

A study to identify the species of introduced European blackberries and their susceptibility to the blackberry rust strains that occur in North America was completed in 2016. The Noxious Weed Program assisted Dr. Bill Bruckart with USDA-ARS to complete the study and publish the finding. The objective was to identify what species of invasive introduced blackberry within the *Rubus fruticosus* Aggregate occurring in the Pacific Northwest and California and test their susceptibility to *Phragmidium* strains that are known from the region in a control greenhouse environment and in field plots to assess the degree of susceptibility to the rust. In addition, morphological studies were completed to help distinguish and identify *Rubus* species. Noxious Weed Program monitored and collected samples and data from 32 sites from 2013 through 2015. Sites and plants for the study were selected based on field observations and previous information collected by a 2010 study that relied on DNA identification. Susceptibility studies were conducted in the field in Oregon and at the USDA-ARS quarantine greenhouse facility in Frederick, MD.

Results of the study conclude, five species of invasive blackberry in the *Rubus fruticosus* Aggregate occur on the western coast of the United States. Four of the five species have been found in Oregon. The two most



Blackberry rust, *Phragmidium violaceum*, on invasive blackberry.

abundant and widespread are *R. armeniacus* and *R. praecox*. *R. vestitus* is only known from Oregon and *R. ulmifolius* from California. Morphological differences are distinct for all five species, but they can be difficult to distinguish in the field by casual observation.

Rubus Species Distribution Abundance

| | | |
|--|--------------------|-----------------------|
| <i>Rubus armeniacus</i> | OR, WA, CA | Common and widespread |
| <i>Rubus praecox</i> (= <i>R. anglocandicans</i> by Clark, 2013) | OR, WA, CA | Common and widespread |
| <i>Rubus laciniatus</i> | OR, WA, CA | Widespread |
| <i>Rubus vestitus</i> | Only known from OR | Limited |
| <i>Rubus ulmifolius</i> | Only known from CA | Limited |

A much clearer understanding of the rust disease caused by *P. violaceum* has been achieved along with an appreciation of its role in population dynamics of the various blackberry species in Oregon. *Rubus armeniacus* has not been found to be diseased in the field. *Rubus laciniatus* has been clearly identified and is diseased in the field. *Rubus praecox* (referred to as *R. anglocandicans* prior to this studies findings) has been identified and is susceptible to the rust disease in the field. At least one other species, *R. vestitus*, is known but is not common, and diseased specimens were noted from the field. Greenhouse inoculations by two Oregon isolates of the rust fungus show that *R. armeniacus* is not susceptible. Two other species, *R. laciniatus* and *R. praecox*, have developed the rust disease in studies.

In conclusion, there are five species of blackberry present on the west coast and there is a clearer understanding of susceptibility to the blackberry rust of each species. Four of the species are susceptible to the rust in varying degrees and one, *Rubus armeniacus*, is not susceptible to strains found from the west coast. *Rubus armeniacus* is widespread in Oregon

along with *R. praecox*, so a large part of the Oregon population is resistant to the rust. This study helps to inform considerations of how to use *P. violaceum* already present in Oregon as part of a biological control program and the understanding of the need to supplement *P. violaceum* with additional agents, particularly for the control of the *R. armeniacus*. Results suggest that the search for additional biocontrol agents should not be limited to additional strains of *Phragmidium*.

Northwest Region

By Glenn Miller and Beth Myers-Shenai

Willamette National Forest

Invasive plant populations on the Willamette National Forest vary in abundance depending on the species and habitat. Spotted knapweed, for example, is primarily limited to road and power line right-of-ways, especially on the main state highway corridors. False brome is locally abundant throughout the Forest except on the Detroit district where distribution is very limited. Knotweeds are found primarily along the Middle Fork Willamette River.

Detroit Ranger District



Beth Myers-Shenai treating spotted knapweed on Detroit Ranger District.

Knapweed populations on Hwy 22 from Detroit to the Hwy 20 junction are at historic lows with plant counts remaining in the low hundreds. Dozens of small sites (1-300 plants) of knapweed were treated at backcountry sites, most of which are located at pullouts or former fill material mining or storage areas. Three larger sites (1,000+ plants) were treated

in off-highway areas, one of which is adjacent to an extensive population under the power line right-of-way that follows Road 46. False brome in the district is sparse, mostly in the vicinity of Road 10 that runs along the south shore of Detroit Lake. There is a small number of false brome on other roadside sites in the district, each with very low plant numbers.

McKenzie Ranger District

False brome is not widely distributed on the McKenzie Ranger District, though, it remains one of the primary targeted weed species. False brome was introduced for elk forage 40 years ago in logged areas resulting in several hundred acres of infested forestland. It is not possible to control this level of infestation, leaving

containment on the roadsides as the only viable control strategy though some limited treatment in thinned areas has been carried out in cooperation with the district botanist. Knapweed control on Highway 126 remains a challenge with many longstanding weed sites refusing to disappear. Combination spray and manual treatments have pushed plant counts lower but constant recruitment from the east side of the state has resulted in new outbreaks occurring each season. Off of the highway corridor, eleven new sites of spotted knapweed were located and treated on forest roads west of the Mt. Washington Wilderness and also on the upper Foley Ridge road systems. Eight new false brome sites were also located and treated. Weedy grass control in the marshes of Lost Lake continue with the goal to protect this highly productive lake and marsh ecosystem.

Middle Fork Ranger District

The Highway 58 corridor has seen increases in knapweed numbers due to seed movement on vehicles from Central Oregon. New outbreaks are discovered and treated yearly. Dalmatian toadflax is also expanding in spite of hand removal efforts. Many miles of forest roads in the Fall Creek and Winberry Creek watersheds are spot treated for false brome. As logging activities have increased in these areas the potential for off-site movement increases. Each year, more road spurs are explored and more infestations are discovered. Knapweed populations on forest corridors fortunately are uncommon and treated when found. Focus areas include the Little North Fork Willamette (Road 19), Hills Creek (FS 21 and 23) roads. In 2016, Noxious Weed Program and Middle Fork staff treated Japanese knotweed infestations that were foot accessible in the Buckhead Natural Area and in riparian areas bordering Highway 58. This project is very difficult due to extensive blackberry populations impeding access.

Sweet Home Ranger District

False brome continues to be a primary target for district botanists and Noxious Weed Program staff on the Sweet Home District. Moose Mountain and Moose Creek roads continue to be the primary target areas. These roads are also the targets of late season blackberry control efforts.

Mt. Hood National Forest

Clackamas and Zig Zag Ranger Districts

Four plant species dominate activities on these districts: spotted knapweed, meadow and orange hawkweed, and now also sulfur cinquefoil. Spotted knapweed was most prevalent on Highway 26, though, extensive road reconstruction removed many weed sites in 2015. Lesser amounts occur on the Clackamas River Highway south to the Detroit District.

Backcountry spotted and diffuse knapweed sites are present but rare. Most occur in the Colowash River watershed on old log landings and along roadsides with little plant competition. Multiple patches of false brome also exist in the same area on Road 46 near the hot springs.

In 2014, small roadside patches of sulfur cinquefoil along Road 46 were located and treated. Further surveys in 2015 located additional dense populations on 3+ gross acres in restored roadside clearings. Two treatments prevented most seed production. Poor soil fertility and sparse background vegetation offer a perfect environment for cinquefoil invasion. 2016 plant counts were significantly reduced and treated twice to shut down seed production.

Treatments on the Lolo Pass hawkweed site progressed this year with the cooperative efforts of a contract crew, forest staff and Clackamas SWCD staff and the Portland Water Bureau. Seven miles of power line right-of-way were covered. Both hawkweed species plant counts are down considerably from original population levels. Native shrubs continue to repopulate the site contributing significant competition to the hawkweed and preventing seed escape from under the canopy. A large infestation of meadow hawkweed was identified north of Lolo Pass on private timberland. At least 200 gross acres are infested. Treatments will begin in 2017.

Orange hawkweed in the ZigZag Wilderness in meadows along the Burnt Lake trail was treated twice, once in early summer before flowering and again in the fall. The treatment area was expanded as more forest openings were explored and more hawkweed located.

Staff also treated Japanese knotweed in the vicinity of the Timber Lake Job Corps facility near the old Ripplebrook Guard Station. All sites have been reduced but eradication still eludes us.

Hood River Ranger District

Many Forest Service road systems in the Hood River Valley are infested with spotted knapweed to various degrees. Treatments on the Lost Lake road, the Wahtum Lake road, Laurence Lake road, Rager quarry and many others have reduced the incidence of knapweed considerably. Recent logging activity, though, has created significant ground disturbance, opening up a seedbed



Sulphur cinquefoil is an aggressive invader of meadows, grasslands and forest openings throughout the west. Photo by Steve Dewey, Utah State University, Bugwood.org.

for knapweeds. Population resurgence has occurred in certain areas and will require an increased commitment to bring the weeds under control.

It excludes native plants and desirable grasses by forming dense monocultures. It often invades after other weeds have been successfully removed. Northeastern Oregon counties contain the largest populations of sulphur cinquefoil in mountain meadows and grasslands. Smaller populations are becoming more prevalent in the Cascade Mountains.

US Army Corps of Engineers South Valley Projects

The US Army Corps of Engineers has extensive land holdings at many south valley dam projects. Generally managed for wildlife, recreation and a fire camp, they host a variety of threatened native plants, as well as noxious weeds that have invaded either from surrounding landowners, on vehicles and equipment used in line maintenance and also from agency fire vehicles brought in from surrounding states at the Hills Creek Fire Camp.

Meadow knapweed is a persistent invader at Fern Ridge and Cottage Grove Reservoirs where Kincaid's lupine populations are being fostered for butterfly habitat. Annual treatments are successfully keeping the knapweed plants in check.

At the Hills Creek Fire Camp and westward across the Middle Fork, sulfur cinquefoil has gained a large toehold. ATV boom operations at the site have reduced plant populations to a very low level as seed production is halted. The cobbly nature of the soils offer perfect habitat for the cinquefoil. Cobbly soils tend to be too droughty for robust perennial grass growth, much needed for competition.

Common Reed, *Phragmites australis*, Control Columbia Slough and Willamette River

Since 2013, Noxious Weed Program staff assisted West Multnomah SWCD staff in treating multiple patches of *Phragmites australis* in the south end of

Columbia Slough and the north end of the Willamette River in northwest Portland. *Phragmites* is a tall-growing, ecologically aggressive grass and can be generally distinguished from the native type by several robust characteristics. It is also easily controlled with glyphosate or imazapyr based products. In 2016, Rich Miller at Portland State University assisted in the treatments by supplying survey time and a boat. Unseasonably cold, wet weather reduced the treatment window this year. Most newly discovered patches were treated along with historical sites. Significant reductions in patch sizes are occurring as a result of yearly treatments.

Water Primrose, *Ludwigia*, Control in the Willamette Watershed

As local organizations took the reigns in organizing and implementing *Ludwigia* control projects in the Willamette basin, Noxious Weed Program staff assumed a role in providing consultation, and financial support for these local efforts.



Significant clogging of irrigation canals and drainage ditches occurs when *Ludwigia* establishes a foothold.

Due to the potential for crop damage and environmental concerns, plant removal is often limited to mechanical means that are expensive and time consuming. Recreation is impacted due to the loss of fish habitat, fishing access, clogging of boating waterways, and swimming areas. Wildlife habitats are degraded by monoculture infestations. Infested waterways suffer drops in dissolved oxygen, which kill fish and invertebrates reducing productivity. Waterfowl lose preferred food plants and feeding grounds. Species richness of all species drops significantly. Infested waterways build up significant populations of mosquitoes.

Bureau of Reclamation Hagg Lake Projects

Noxious Weed Program staff treated Armenian blackberry and Scotch broom on a 10-acre parcel along the shores of Hagg Lake in Washington County that provides core habitat for Kincaid's lupine, and its associated threatened and endangered Fender's blue butterfly. In an attempt to reopen prairie habitat, large monocultures of



Blackberry thicket covering sign at Hagg Lake.



Glenn Miller and Beth Myers-Shenai treating *Phragmites australis*.

blackberry were treated using an RTV handgun, and Scotch broom seedlings were treated with a backpack sprayer. The 2016 treatments were an expansion of brush control efforts conducted in 2015.

Early Detection and Control of “A”-Listed Weeds

Giant Hogweed, *Heracleum mantegazzianum*

In 2015, Noxious Weed Program staff worked with City of Portland, Clackamas SWCD, Columbia SWCD, Clatsop SWCD, Tualatin SWCD, Tillamook SWCD, and Hood River SWCD to monitor and treat all known locations of giant hogweed in Oregon. Through outreach and survey efforts, a small number of new sites in Portland were located and work is underway to secure permission from property owners to ensure they get treated. Most sites are in current or former residential landscape settings. Fanno Creek and Vermont Creek, both in the Portland Metro area, are the two known riparian infestations of giant hogweed in the state. No plants were found along Vermont Creek this year, and over 40 percent of the 125 previously recorded patches along Fanno Creek had no observable plants.

Work is currently underway to update and analyze the giant hogweed database. Fifty-two of the initial 193 sites have been considered eradicated, 12 of them were given that status this year alone. Twenty additional locations have had no plants recorded for four years. These will be added to the eradicated list pending monitoring for no occurrences next year. As database analysis continues, sites that are considered eradicated will likely increase. Overall, active giant hogweed sites and plant numbers have dropped significantly since it was first discovered in Oregon in 2001.

Goatsrue, *Galega officinalis*

After observing no plants in 2014, Noxious Weed Program staff treated 3 goatsrue plants this year at a sand and gravel operation site in Tualatin that has



Goatsrue leaves, Portland International Raceway site.

been under monitoring and treatment for about 5 years. The City of Portland reported treating 3 existing locations of goatsrue. Also confirmed is a new site at the Portland International Raceway of about ¼ acre in size. It was too late for treatment at the time of discovery, but it will be treated next year.

Matgrass, *Nardus stricta*

In November 2015, the North Coast Land Conservancy (NCLC) via the iMapinvasives database reported a new matgrass site located in a coastal prairie. The plant had previously only been known from a pasture in Klamath County. An



Matgrass in coastal prairie.

alert was sent to the database administrator, as this was a new record in Clatsop County for the A-listed weed. The administrator advised NCLC staff to notify ODA's Noxious Weed Program and a specimen was subsequently sent to the OSU herbarium for positive identification. Noxious Weed Program staff visited the site containing approximately 100 plants spread over 1000 ft². The Oregon State Weed Board funded a grant to survey for additional sites and eradicate the existing location. The treatment was made by local personnel.

Matgrass is a slow growing perennial bunchgrass that is densely tufted, and long-lived. It produces unbranched flower-spikes that carry the single-flowered spikelets along one side only. Leaves are hard and bristle-like, bluish green, up to 1/4 inch wide, appearing narrower because blades are tightly folded along the midrib. The stem is tipped by inconspicuous spikes that bear all spikelets on one side of the stems and grows up to eight inches tall. This grass is tightly rooted therefore hard to remove.

Yellow Floating Heart, *Nymphoides peltata*

Multiple new sites have been detected on the Willamette River in 2016. The point source for these infestations may be near Eugene at a golf course. Further surveys are planned. Treatment of a large site on a side channel of the Willamette was conducted by Noxious Weed Program staff with the assistance of State Parks personnel and their



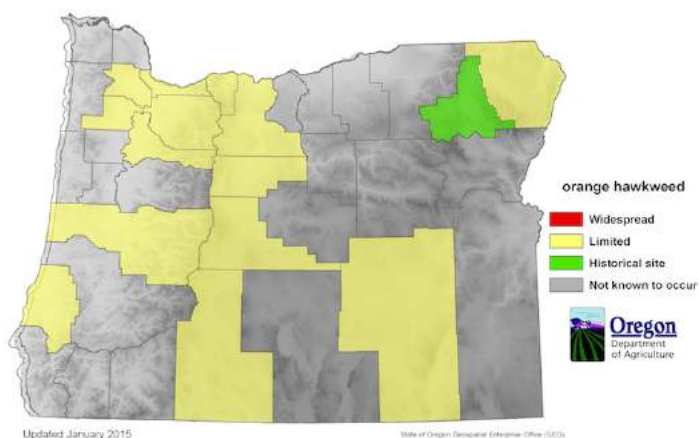
Yellow floating heart in the Willamette River. Photo by Marci Crass.

jetboat. Other sites have been detected, which are smaller and were hand-pulled by cooperators. Noxious Weed Program Staff worked with the homeowners association at Horseshoe Lake near Albany to develop a long-term strategy to rid the lake of floating heart. Current glyphosate or imazapyr treatments are not working.

In western Oregon, oblong spurge thrives in moist grassy bottomlands even with significant plant competition. In other states, infestations appear to be spreading more aggressively, perhaps by establishing on drier sites with little competition. Oblong spurge has the potential to infest pastures, natural areas and sunny riparian areas in Washington and Oregon. It is well adapted to a wide range of shrub and pine forest environments also. In California, it has been found associated with French broom, blackberry and in dry drainages along roadsides.

Orange Hawkweed, *Pilosella aurantiacum*

Besides the work mentioned above on Lolo Pass in Mt Hood National Forest, there is also a small patch along Highway 22 in Willamette National Forest where a few plants appeared this year; they were hand-pulled by the district botanist. There are also scattered locations of orange hawkweed in the Portland area, many of them intentionally planted as ornamentals, often dispersed through plant trading. City of Portland staff monitor these, offering assistance to residents to treat them as needed, and reporting site status to ODA's Noxious Weed Program.



Paterson's Curse, *Echium plantagineum*

There were multiple treatments conducted by Noxious Weed Program staff on the Lebanon Paterson's curse roadside site. One persistent population was chemically treated twice and then hand-pulled later in the season to prevent flowing. All other former locations contained no plants.

Cordgrass, *Spartina* spp.

Noxious Weed Program staff, utilizing boat and foot surveys, searched the Nehalem, Alsea, eastern side of Tillamook and Siletz bays. No additional *Spartina* populations were found.

Oblong Spurge, *Euphorbia oblongata*

There was a resurgence of oblong spurge at Oregon's largest site, located in Salem. It is believed to have been introduced as a contaminant in flax seed that was grown and processed at the location in the mid-1900's. The core infestation is at the current location of the Oregon Office of Emergency Management where it lines the south shore of a pond, and it has also moved off site along a drainage ditch to the adjacent Oregon State Penitentiary property along Mill Creek. Noxious Weed Program staff treated all known locations with imazapyr herbicide.

There are also scattered locations in the Portland Metro area that City of Portland and Clackamas SWCD staff are monitoring, treating, and reporting to ODA's Noxious Weed Program. It is not entirely clear how many of these urban locations originated, but some of them may have been planted as ornamentals.

Southwest Region

By Carri Pirosko

Early Detection Rapid Response Projects

Lesser Celandine in Jackson County

The first reported occurrence of lesser celandine, *Ranunculus ficaria*, in Jackson County was reported, confirmed, and treated this season. A population escaped from a planted flowerbed into an adjacent pasture.



Federal and state partners working to remove Dyer's woad from a property adjacent to the Siskiyou National Monument.

Gorse Action Network

Noxious Weed Program staff has participated in a coastal, grass-roots, gorse-focused group that seeks to: raise awareness, provide control guidance to landowners, implement large group control projects, and prevent further spread of gorse. The group, which meets regularly and has expanded outreach along the coast, is working to establish several demonstration projects, secured funding for the development of a strategic plan, and completed a comprehensive mapping project. A representative from Oregon



Noxious weed partners from Southern Oregon meet at OINW to discuss the formation of a new south coast CWMA. From left: Carri Pirosko—ODA's Noxious Weed Program, Alexis Brickner—Coos Watershed Association, Sherri Laier—State Parks and Recreation, Jeanne Standley—BLM, and Dustin Williams—Curry SWCD.

Solutions visited with the group to gather information that will lend toward consideration of the Gorse Action Group (GAG) vision as an official project. Projects selected by Oregon Solutions are offering both facilitation and directional support to help communities reach defined project goals.

Noxious Weed Education and Outreach

Noxious Weed Program staff gave presentations at the: OSU IPM Conference in Jackson County, Douglas County Weed Day, Douglas County Livestock Association's Breakfast Seminar Series, and Oregon Interagency Noxious Weed Symposium (OINW) held biennially in Corvallis.

The *Alyssum* Story

Yellowtuft, *Alyssum murale* and *A. corsicum*, are perennial plants native to Eastern Europe. *Alyssum* species are unique in that they can hyper-accumulate metals extracted from the soil in leaf and shoot material. The USDA has used hyper-accumulating plants in cleaning up contaminated mining spoils through a process called phytoremediation.

In the 1990s, Viridian LLC proposed the use of *Alyssum* species for phyto-mining, the removal of metals from naturally high mineral (serpentine) soils. *Alyssum* species were planted by Viridian LLC on nine serpentine-rich sites in the Illinois Valley of southwest Oregon. Originally planted fields including those on private lands and lands owned by Josephine County and managed by the Illinois Valley Airport.

The originally planted airport fields are located immediately adjacent to the floristically diverse Rough and Ready Botanical Area. The Illinois Valley contains the largest concentration of serpentine soils in Oregon and supports a diverse and unique flora. Fifteen plant taxa with conservation status listed as rare, threatened, or endangered by ODA's Native Plant Conservation Program, US Fish and Wildlife Service,

or Oregon Natural Heritage Information Center occur in this area. Eight Dollar Mountain and Rough and Ready Creek are federally protected as Areas of Critical Environmental Concern (ACEC). Many of the planted *Alyssum* fields are directly adjacent to these highly valued botanically rich treasures.

In 2005, local citizens and federal land managers reported *Alyssum* flowering far from cultivated fields and were becoming skeptical of early assertions regarding the inability of these species to escape cultivation. Evaluation and documentation by an interagency task force began in 2005 and continued through 2008. The Noxious Weed Program completed a Weed Risk Assessment that resulted in two *Alyssum* species being listed as A-rated weeds by the Oregon State Weed Board in 2009.

Alyssum Treatment

Three new sites of *Alyssum* spp. in the Caves Highway/Chapman Creek area were detected via helicopter survey this season. Two sites are on private property and one is on BLM land. All three sites were located via ground efforts and treated. A dozen other *Alyssum* plants/patches detected from the helicopter were in already known infestation zones and were all treated.



Helicopter survey was once again instrumental in the detection of three new populations of *Alyssum* in the Illinois Valley.

A considerable reduction in plants was realized just one year after a sizable new *Alyssum* site was discovered and treated in the Chapman Creek area. Noxious Weed Program and federal partners cooperatively treated (13.4 gallons compared to 31 gallons in 2015) the site on 3 separate occasions, in addition to many surveys.

Despite above average winter/spring rainfall, germination rates at all Viridian (originally) planted fields continued to decrease (64 gallons compared to 272 gallons in 2015 and 488 gallons in 2012). Since treatments began in 2009, this project has achieved



A yellow swath of *Alyssum* hidden in the vegetation is visible from the air.

a 96% reduction in herbicide applications required to reach annual eradication goals. This may be an encouraging indication that eradication efforts are finally beginning to deplete the *Alyssum* spp. seed banks.



A new *Alyssum* site detected through helicopter surveys was later treated by the Noxious Weed Program and BLM.

Alyssum spp. populations that escaped planted fields continue to dramatically decrease as well. Noxious Weed Program staff and volunteers pulled only a few dozen *Alyssum* plants from an infested section along the Illinois River (Patton Bar to the Second Bridge) compared to hundreds of bags in previous seasons. Numerous volunteer days were organized for locations designated as hand-pull only. An USFS-BLM team conducted manual treatments and survey on federal lands.

Funds from both the Rogue-Siskiyou National Forest and the Medford-Grants Pass BLM Office were critical in allowing the wide scope of work to continue on *Alyssum* this season.



CEEN Volunteer, Tim Leyba stands with bags of *Alyssum*, all that remains from a previously infested fields in the background.

Rough and Ready Creek Barbed Goatgrass

Barbed goatgrass, *Aegilops triuncialis*, an A-listed weed was detected in 2003 along Hwy 199 near Rough and Ready Creek, south of Cave Junction in Josephine County. While infested acres of barbed goatgrass are increasing in California, this is the only known population in Oregon. Three volunteer sweeps were made across the area to manually remove and bag plants; one bag was taken off-site and destroyed compared to 4 bags in 2015. The infestation zone extends across private, state, and federal boundaries. No new sites were found this season. Support from both the Rogue-Siskiyou National Forest and the Medford-Grants Pass BLM Office lend to the ongoing success of this eradication project.



Volunteers are victorious after a collaborative day of hand-pulling barbed goatgrass from the only known site in Oregon.



In 2016, a large new site of woolly distaff thistle was detected and treated in Douglas County.

Woolly Distaff Thistle

Woolly distaff thistle, *Carthamus lanatus*, was discovered in Oregon in 1987. This non-native weed is known to infest vast acreages in California and also Australia. Elimination of seed production and seeds banks in the soil are both essential when battling an annual thistle.

This project involves the control, survey, and monitoring of all known infestations of distaff thistle. At a minimum, each site is worked three times each year. Crews apply herbicide with backpack sprayers early in the season and use manual methods later in the season. The Noxious Weed Program continues to provide supervision and coordination for this project.

Above average rainfall resulted in an increase in distaff thistle germination this season compared to drought conditions in 2015. August surveys resulted in a new location of distaff thistle just east of Glide on the Lone Rock Ranch. Four net acres of distaff thistle were treated behind Cougar Point, a guiding landmark on the ranch. Otherwise 2.1 net acres treated across the remaining infested properties/sites. This was double what was found under drought conditions in 2015, but lower than in all previous seasons. Thirty-six percent of sites showed an increase in total plants found while twenty-seven percent decreased. Twenty-two percent of sites showed no change and fifteen percent are being tracked as eradicated. Sites are still checked annually due to longevity of seed in the soil profile. Herbicide usage was at 184 gallons, of which 105 gallons was put out at newly discovered sites (found in both 2015 and 2016) at Lone Rock Ranch.

| Plant count per site | Sites per category |
|----------------------|--------------------|
| 0 plants | 7 |
| 1-10 | 4 |
| 11-100 | 12 |
| 101-500 | 9 |
| 501-1,000 | 4 |
| 1,001-5,000 | 4 |
| > 5,001 | 5 |

Douglas County Paterson’s Curse

Paterson’s curse is an A-listed weed species that threatens Oregon’s native habitats with the potential to invade oak woodlands, native prairies, and dry upland slopes. Despite a beautiful appearance, this invasive weed is truly a curse in that it is toxic to livestock and has the potential to infest thousands of acres as demonstrated in Australia.

An infestation of Paterson’s curse was identified on private lands southeast of Dillard in Douglas County in 2004. Initially 80 net acres of the project area were treated aerially, while the remaining twenty acres (not accessible by helicopter) were treated with ground equipment. A private contract crew, managed under an agreement with Douglas SWCD, has worked the 300 acre gross area using backpack sprayers since 2008.

This season saw another drop in the numbers of Paterson’s curse plants detected and treated. The number of plants detected spiked in 2013 at 13 net acres. An impressive 65% decrease in Paterson’s curse plants was achieved between 2014 and 2015. Net acres detected and treated this season decreased to 1.2 acres compared to 4.2 acres in 2015.

Yellow Floating Heart, *Nymphoides peltata*

Five yellow floating heart infested water bodies are known to occur in southwestern Oregon. No new infested ponds were detected in 2016. In Jackson



After two years of treatment, not a single yellow floating heart plant could be found at golf course ponds in Roseburg.



Yellow floating heart was significantly reduced after one year of treatment.

County, over the past five years, the Rogue-River Siskiyou National Forest has nearly eradicated an infestation at Little Squaw Lake. In 2016, only a few small plant fragments were detected. Persistence, bottom barriers, and divers have proven instrumental in this control effort. In Douglas County, two private ponds near Kellogg and two ponds at a golf course in Roseburg were surveyed in the spring, summer, and fall. Not a single plant was found in the golf course ponds this season. Continued reduction in plant density was realized at both Kellogg ponds. Imazamox was used in spring and summer treatments, while imazapyr was used in the fall at one Kellogg pond.

After one year of treatment, an estimated 90-95% reduction of plant density was realized in a fire pond on the Umpqua National Forest. This season, Noxious Weed Program staff conducted late summer treatments (Imazapyr) targeting remaining pockets of yellow floating heart.

Coos and Curry County Matgrass

Last season an infestation of matgrass, *Nardus stricta*, was confirmed at Cape Blanco airport in Curry County. Matgrass can be found infesting three main trails, into



Circles of matgrass infesting the lawn are under treatment at Devil's Kitchen, part of the Bandon Recreation Area.



Matgrass treatment site with Sherri Laier, Oregon State Parks & Recreation.

several open areas, and along both sides of the airstrip. Infestations are scattered and vary from light to heavy, with the airstrip revealing a solid cover of matgrass along both mile-long sides. Botanically, the area is noted for a unique pygmy forest and is one of the few remaining habitats for the federally endangered western bog lily.

This new population was treated in the spring via a collaborative effort between Oregon Department of Aviation, Oregon State Parks and Recreation Department and Noxious Weed Program staff. Two additional infestations of matgrass were confirmed and treated this season at Devil's Kitchen and Bandon Wayside in Bandon, Coos County.

US Forest Service Projects

USFS State and Private Forestry Program

Funds from the USFS State and Private Forestry Program and the Rogue-Siskiyou National Forests were stretched far in the southwestern corner of the state this season. Federal funds made outreach, survey, and treatment efforts for *Alyssum* spp., matgrass, Paterson's curse, dyer's woad and gorse possible.

Rogue River-Siskiyou National Forest (NF)

Spotted Knapweed, *Centaurea stoebe*

Compared to Central Oregon, a limited number of spotted knapweed acres is known to occur in the Rogue River Watershed. That said, continual soil disturbance from wildfire, logging, and road construction and maintenance have resulted in expanded populations along Highways 140 and 230, and to a lesser extent, along Old Highway 99 and roads leading up to the Mt. Ashland Ski Resort.

This season, the Noxious Weed Program put out 26 gallons of mix at spotted knapweed sites along Highway 140 and at a few sites off of adjacent side roads. USFS staff and Noxious Weed Program staff put out 6 gallons of mix at spotted knapweed sites along Highway 230. Noxious Weed Program and partners treat all known spotted and diffuse knapweed

infestations on the east side of the Rogue River-Siskiyou National Forest. USFS crews control and monitor west-side infestations.

Biddy Biddy, *Acaena novae-zelandiae*

Biddy biddy is native to New Zealand. It is believed that the plant first spread to the US and other countries in the wool of imported sheep. The first official record of biddy-biddy in Oregon dates from 1951 in Curry County. Currently, only Coos and Curry counties contain infestations near the coastline.



Left: Biddy biddy hitchhikes from infested areas easily. Right: Treatment of biddy biddy at the Cape Blanco lighthouse.

This species prefers open, disturbed, and well-drained sites, including stable dunes, open scrub, grassy areas. High traffic locations in coastal habitats where some summer moisture is available and frosts are infrequent are also subject to invasion. Plants thrive on poor soils and compete with native plants on coastal bluffs and in lawns where it forms dense mats.

Noxious Weed Program staff cooperated with Oregon Parks and Recreation Department in treatment of biddy biddy at Cape Blanco State Park. In addition, test plots were put out at the USFS Ranger Station in Gold Beach.

Umpqua National Forest Knapweeds

Diffuse, *C. diffusa*, and Spotted, *C. stoebe*, Knapweeds

Knapweed control is a priority in the Umpqua River Watershed. A majority of known populations occur on the Umpqua NF in the Diamond Lake/Highways 138 and 230 area of eastern Douglas County. The USFS intensively surveys and monitors both knapweeds across the forest. The Noxious Weed Program assists with herbicide treatments at larger sites, while the USFS manually removes smaller patches. This federal-State partnership has resulted in a steady decline of

spotted and diffuse knapweed levels on the Umpqua NF. This season, 6 gallons of mix was used to treat spotted knapweed sites along canals and off of Highways 138 and 230 on the Diamond Lake District.

North and South Central Region

By Mike Crumrine

Deschutes/Ochoco National Forests

The Noxious Weed Program has had a long-standing partnership with the Deschutes and Ochoco National Forests to complete noxious weed control activities on the two forests. Over the course of the 2016 season, Noxious Weed Program staff treated nearly 147 acres of noxious weeds over thousands of gross acres. Treatments spanned from spotted knapweed in campgrounds, recreation areas, and open forest to roadside knapweed and St. Johnswort treatments and on to riparian treatments of orange hawkweed, ribbon grass, and yellow flag iris.

The most notable and highest profile project continues to be the treatment of ribbon grass and yellow flag iris on the Metolius River. Treatments began in 2013 for ribbon grass and yellow flag iris on the Metolius River downstream of Camp Sherman, immediately adjacent to the Gorge Campground. This area was treated for the fourth year in a row and has seen significant reductions in both the iris and ribbon grass populations.



Mike Crumrine treats ribbon grass at the Metolius River.

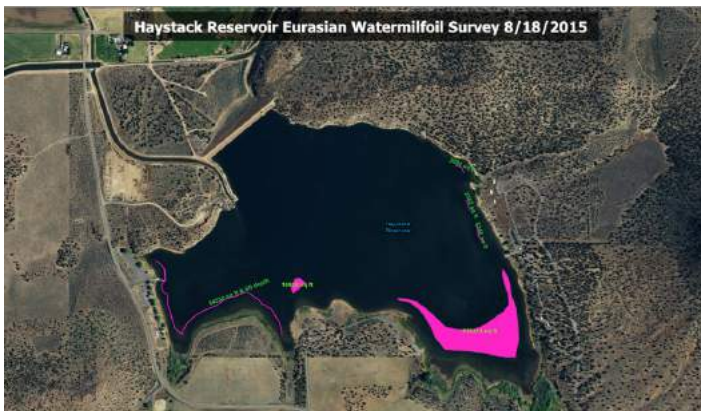
As in 2015, the one-mile reach of the Metolius River above the Allingham Bridge was treated again in October 2016. Over a single day, three Noxious Weed Program employees, including Noxious Weed Program Manager, Tim Butler, backpack sprayed the one-mile stretch and the Gorge Campground areas. From the single treatment in 2015, ribbon grass and iris have been reduced by 75% within this reach.

The Bureau of Reclamation (BOR) owns and manages many facilities throughout Oregon. These irrigation and recreation related operations are managed by



Mike Crumrine, Tim Butler, and Glenn Miller maneuver the Metolius River to reach the ribbon grass treatment site.

BOR or their operating partners. The Bend Field Office of the Pacific Northwest Region has contracted with the Noxious Weed Program and Crook County to address weed and vegetation problems in both eastern and western Oregon. Within the North Central region, the Noxious Weed Program conducts treatments at Wickiup Reservoir, Crane Prairie Reservoir, and Haystack Reservoir.



For 2016, the key project conducted in a joint effort with Crook County is the aquatic treatment of Eurasian watermilfoil, *Myriophyllum spicatum* on Haystack Reservoir. The Haystack Reservoir area encompasses 271 acres of land and 233 acres of water surface, with 5 miles of shoreline. At full pool, the mean depth is 27 feet, and the maximum depth is 75 feet. Based on an August 18, 2015 inventory, 10 acres of the lake are affected by mix of elodea, coontail, and milfoil.

On October 10, Noxious Weed Program staff with the support of Crook County treated 2.5 acres of Eurasian watermilfoil using an Noxious Weed Program boat along the entire southern



Eurasian watermilfoil. Photo by Graves Lovell, Bugwood.org

shoreline. This year's treatment is another significant step in reducing the public swimming hazard and environmental harm this highly invasive species brings to this waterbody.

Eurasian watermilfoil creates significant economic impacts to waterways, irrigation ditches, and drainage canals, inhibiting flow and increasing vegetation removal costs. It is also a significant noxious aquatic weed of rivers, lakes and ponds where it reduces water quality, impedes recreation and boat access, and has adverse impacts on fish habitat. Elevated nutrient levels created by erosion, fertilizers or urban runoff provide nutrients, stimulating rapid growth. Expensive control projects frequently target this plant across North America.

Prineville BLM Biocontrol Projects

In 2016, the Noxious Weed Program was excited to collect and introduce the biocontrol agents, *Jaapiella ivannikovi* (a bud gall midge) and *Aulacidea acroptilonica* (a stem gall wasp) for Russian knapweed on BLM lands



Adult Russian knapweed gall wasp, *Aulacidea acroptilonica*.

adjacent to the John Day River and Bridge Creek near Mitchell, OR. Initially introduced to areas along the Columbia River and a site in the Crooked River Grasslands, these agent's establishment and apparent damage to adult Russian knapweed plants provides a renewed hope for long-term control and reductions to long-standing, dense populations of Russian knapweed. In all, 5 releases were made to three different sites.

Special Projects in North Central

Hoary Alyssum

Hoary Alyssum, *Berteroa incana*, a member of the mustard family, is an annual to short-lived perennial forb native to east-central Europe and western Asia. It is an aggressive invader in fields of alfalfa, clover, or birdsfoot trefoil and is a newly listed A-rated noxious weed in the state of Oregon. Currently there are known populations in Wallowa and Deschutes counties. Of these known sites, Deschutes County has located two populations; one east of the town of Sisters and another situated just north of Bend. Prior to the plants listing by the Oregon State Weed Board, Deschutes County treated the population near Sisters in 2014. The site north of Bend had been treated in 2015 and an expanded area south of the 2015 treatment was sprayed in 2016.



Hoary alyssum treatment in Deschutes County.

Hoary alyssum is toxic to horses, usually when they encounter the plant in hay. It lowers production, nutritive characteristics, and palatability of alfalfa hay crop. It has few herbicide choices in broadleaf crop scenarios. Goats and sheep were found to select against or reject hay with Hoary alyssum in it. It can reduce the productivity of grazing lands. The plant spreads readily with soil movement, rail and road system management and can be easily transported between fields on unwashed haying equipment.

Yellow Floating Heart

Yellow floating heart, *Nymphoides peltata* and two closely related species are marketed as aquatic garden ornamentals and are well adapted to garden pools, shallow lakes, and slow moving rivers. Wherever it has been introduced into the wild, it has proven to be a prolific grower with the capability to dominate shallow lake surfaces. Dense mats of leaf material all negatively impact fish and wildlife habitat, recreational access and water quality. Dissolved oxygen, light penetration, species diversity and fish productivity all decrease in infested waters. Fortunately, the plant is rare in Oregon and is currently an A-listed weed by both the state and Central Oregon counties.



Installation of landscaping cloth to cover the entire bottom of a Redmond area irrigation pond in an attempt to solarize yellow floating heart.

In September 2013, a report came in that a stock pond near Redmond contained yellow floating heart. Investigation, image analysis, and reports from the general public after radio and newspaper articles have turned up a total of eight infested ponds and water features within Deschutes County. All of the newly discovered sites were treated by the Noxious Weed Program. The 2013 treatments had varying success believed to be largely a factor of their discovery and treatment late in the fall. For 2014, treatments continued on the eight original sites and three additional sites were found and treated in July with different herbicides.

As with the treatments of 2013 made in the fall season, the treatments since have proved to be a mixed result. Some sites showed noticeable improvement, while some appeared to have no effect from prior year chemical treatments.

At one of the pond showing little improvement due to herbicide treatments, landscaping cloth was installed in April 2016 as an attempt to smother the persistent weed.

African Rue

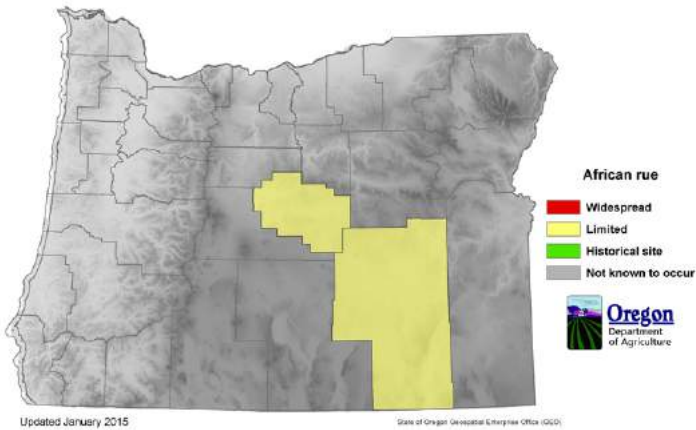


African rue in Crook County.

African rue, *Peganum harmala* is a native of North African and Asiatic deserts and was first reported in North America in 1928 near Deming, New Mexico. Oregon's first population was located in Crook County in the mid 1960's. The OSU herbarium specimen did not identify a specific location. A member of the Oregon Native Plant Society located the site. The plant has been rated an A-listed weed both in Oregon and in Crook County.

There were no major changes in the status of the African rue in Crook County; the main portion of the infestation is along Highway 27. The infestation is on both public and private lands with the main portion of the infestation on BLM land.

Crook County has completed all the control work since 2012. Plants continue to be found in the known control area in small quantities. The roadways leading into and out of the control area and the surrounding rangeland are surveyed yearly. No new plants were



found outside the known area of infestation. The population remained static in 2016.

Squarrose Knapweed

Squarrose knapweed, *Centaurea virgata* is a native of Southwest Asia and the Middle East that became weedy in the 1950's in northern California. The original introduction date into the US is not known. In 2003, while treating a patch of knapweed along the railroad tracks in northern Jefferson County, Floyd Paye, Jefferson County Weed Control, noticed that the plants were not diffuse knapweed. The Noxious Weed Program confirmed that the plants were most likely squarrose knapweed, later confirmed by the OSU herbarium.



Squarrose knapweed flowers.

Ten plants were found in 2004 by Jefferson County and the Noxious Weed Program. Five plants were treated and controlled in 2005. Two immature plants were found in the spring of 2009 and controlled. Three flowering plants were controlled in 2010.

All the flowers were cut and bagged and the remaining plants were treated.

This population of squarrose knapweed has not produced seed since 2003. At times plants are found but with both Jefferson County and the Noxious Weed Program watching this site, these plants have not seeded since this location was found.

Orange Hawkweed

Orange hawkweed, *Hieracium aurantiacum* is a native of northern and central Europe. It was first introduced into the US in 1874 in Vermont as an ornamental plant. As an escaped ornamental, it began spreading in the Northeast of the US and since then moved throughout much of North America. In 2005, some plants were found in the city of Sisters, OR. As a result of that find and press coverage, 16 confirmed locations were

found all in Deschutes County. Also located was a nursery that was selling orange hawkweed as “orange aster”. The current owners purchased the nursery 11 years ago and had the orange aster in stock and continued to sell until those plants were confiscated and destroyed in 2005.

Additional sites were located 2009, in several residential properties in west Bend. Subsequent publicity in 2009 resulted in 50 additional locations in central Oregon. Annual media stories continue to add to the number of known locations. The sites numbered over 100 in 2013. As part of an Noxious Weed Program grant, Deschutes County treated 1.75 acres in 2013.

Treatment strategies shifted for 2014 with Deschutes County. Funded by grant dollars, the county offered a cost share option to residential private landowners. Treatments were also conducted on public and private lands by Noxious Weed Program staff at several sites throughout the Deschutes County. The same program continued with Deschutes County providing herbicide and equipment for those landowners affected by orange hawkweed during the 2016 season.

A single population of orange hawkweed exists in Crook County. This single property in Prineville is the only known orange hawkweed site within Crook County. Both Noxious Weed Program and Crook County staff made multiple treatments.

Purple and Iberian Starthistle

Purple and Iberian starthistle, *Centaurea calcitrapa* and *C. iberica* are native to southern Europe and northern Africa. They were first introduced into North America in 1886 in California. In late June of 2009, Don Farrar, Gilliam County Weed Supervisor, found a nine-acre pasture just south of Spray in Wheeler County that was confirmed as purple/Iberian starthistle. The following day, Don and the Noxious Weed Program staff treated the pasture with herbicides. Several plants were discovered in the flood plain of the John Day River and were also treated.



Purple/Iberian starthistle flower.

The Noxious Weed Program covered the lower nine acres twice and treated three of the original nine acres in 2011. The John Day River flooded over a portion of the lower nine acres and treatments had to wait until the river receded. The Wheeler County SWCD and Noxious Weed Program staff surveyed 4,500 acres in

the upper portions of the Todd Malvaney Ranch. No new purple/Iberian starthistle was found.

Cy Miller, the current Wheeler County SWCD Weed technician, has actively surveyed this site and adjacent properties throughout the 2013 to 2016 seasons. The initial population has not produced seed since 2009. No plants were reported from 2013 - 2016.

BLM, Lakeview District: Lakeview

The Klamath Falls Resource Area (KFRA) lies within the boundaries of Klamath County, in the south central area of Oregon. It lies just north of California and extends from the crest of the Cascade Mountain Range at the Jackson County line east to Lake County. The KFRA has a very diverse ecology from west to east ranging from Douglas fir forests, pine forests, Juniper forests, marshes and wetlands, to sagebrush rangeland. The terrain of the KFRA ranges from mountains to marshy lowlands, and includes part of the Klamath River Canyon. The elevation of the KFRA ranges from 4,100 feet to nearly 6,000 feet.

In 2016, five regions within the KFRA were the focus of treatment and survey of invasive weeds. Noxious weed species in the area include; Canada thistle, Musk thistle, yellow starthistle, Scotch thistle, Mediterranean sage, yellow toadflax, Dalmatian toadflax, leafy spurge, diffuse knapweed, spotted knapweed, Russian knapweed, Dyers woad, spiny cocklebur, whitetop, perennial pepperweed, and St. Johnswort.

In the boundaries of KFRA, Noxious Weed Program staff treated 88.3 net acres of noxious weeds and surveyed 15,000 total acres. Biocontrol monitoring occurred for *Mecinus* spp. populations on Dalmatian and yellow toadflax and *Ceutorhynchus litura* and *Urophora cardui* populations on Canada thistle infestations.

BLM, Klamath Falls Resource Area (KFRA)

The KFRA lies within the boundaries of Klamath County, in the south central area of Oregon. It lies just north of California and extends from the crest of the Cascade Mountain Range at the Jackson County line east to Lake County. The KFRA has a very diverse ecology from west to east ranging from Douglas fir forests, pine forests, Juniper forests, marshes and wetlands, to sagebrush rangeland. The terrain of the KFRA ranges from mountains to marshy lowlands, and includes part of the Klamath River Canyon. The elevation of the KFRA ranges from 4100 feet to nearly 6000 feet.



Bryant Mountain, weed warrior.

In 2016, five regions within the KFRA were the focus of treatment and survey. Noxious weed species in the area include; Canada thistle, Musk thistle, yellow starthistle, Scotch thistle, Mediterranean sage, yellow toadflax, Dalmatian toadflax, leafy spurge, diffuse knapweed, spotted knapweed, Russian knapweed, Dyers woad, spiny cocklebur, whitetop, perennial pepperweed, and St. Johnswort.

In the boundaries of KFRA, Noxious Weed Program staff treated 88.3 net acres of noxious weeds and surveyed 15,000 total acres. Biocontrol monitoring occurred for *Mecinus* spp. populations on Dalmatian and yellow toadflax and *Ceutorhynchus litura* and *Urophora cardui* populations on Canada thistle infestations.

Matgrass Treatment Project

Matgrass, *Nardus stricta*, is a bunch type, low growing perennial grass that is not palatable for grazing by cattle, horses, elk, or other animals. Matgrass starts growing early in the spring before most other pasture grasses and sets seed early in June in the Fort Klamath area at the foot of Crater Lake. Matgrass seedlings are very hard to see amongst other pasture grasses, as their crowns will range from the size of a dime to the size of a quarter. Seedlings have very fine but stiff leaf blades that are only about one to two inches tall and will set seed in their first growing season. Matgrass seeds are thrown from the mature seed head several inches making a colony of plants roughly circular in shape, from one to three feet in diameter in just one or two years. Second year plants usually are two or three inches in diameter and often have some brown leaves at the center of the crown. Spotting the second year plants is somewhat easier although still difficult if the other pasture grasses are growing.

Matgrass was first noticed in a peat pasture about 38 years ago by the landowner near Fort Klamath, Oregon. The infestation is located approximately one mile west of Fort Klamath and is the only matgrass known to occur in Oregon. However, two new sites have been identified on the Oregon coast in Clatsop and Curry counties. It has been speculated that the matgrass seed was brought to the site by migratory birds from Siberia or Scandinavia where matgrass is native. The farming practices of dragging the pastures to break up cattle manure clumps in the early spring and flood irrigation have moved the matgrass plants over about 180 acres of pasture.

The landowner started control efforts on the matgrass infestations about 37 years ago. About 30 years ago, Klamath County Noxious Weed Control personnel began to help the landowner treat the matgrass and continued treatment efforts for the next 10 years. The treatment effort was then turned over to ODA's Noxious Weed Program. During the last 20 years, the Noxious Weed Program has since led the effort

to eliminate or contain the matgrass infestation. Eradication of the matgrass infestation is probably not possible unless the grasses on the entire pasture area were eliminated for the life of the matgrass seed in the soil seed bank.

Differing from prior years, treatments were made mid-summer, after the more palatable pasture was grazed, making the matgrass easier to find. In 2016, 0.8 net acres of matgrass were treated over the 180-acre project area.

Taurian Thistle, *Onopodum tauricum*

Taurian thistle was first found in the foothills near Klamath Falls in 2007 and is the only known site in Oregon. California has two historical sites in Modoc County of less than four acres and some sites in the hills around Monterey and also some scattered sites in the southern Sierra Mountains. The only other reported Taurian thistle in the United States has been in Pueblo County in Colorado. Taurian thistle, a sister plant to Scotch thistle, has the potential to be more invasive than Scotch thistle. Taurian thistle is a lime green colored plant with large baseball sized terminal flower heads that resemble an artichoke before opening. The leaves feel sticky like glue to the touch but leave no residue on the fingers.

In 2007, there were 250 large plants and seedlings scattered over four gross acres. All plants in the infestation area were treated by the Noxious Weed Program staff in 2007, 2008, and 2009 and again in 2010. In 2011, Klamath County Weed District and the Noxious Weed Program found no bolting plants and about 15 seedlings and rosettes at the site, which were treated. In 2012, the Noxious Weed Program and Klamath County Weed District found an increase in rosettes and bolted plants totaling around 60 at this site. All were treated by Klamath County Weed District.

In 2012, an additional two sites were found west of Klamath Falls adjacent to Hwy 140. The larger of the sites was east of the highway completely encircling a two-acre private residence. The owner had been chopping the thistle since he discovered it in 2008, but with the property unoccupied for 2012, the thistles were allowed to mature. The smaller site across Hwy 140 appears to be younger. Both sites had seedlings, one-year-old rosettes and bolted plants. Both sites combined totaled around 200 plants and one net acre of 5 gross acres were treated. Each of the treatments was evaluated for effectiveness three weeks later and the larger, unaffected plants were re-treated with a different herbicide by Klamath County. These two newer sites were treated in 2013 by the Noxious Weed Program. Only a handful of plants were found and treated this last year.

The 2014 season found no weeds at the Hwy 140 sites during surveys. In discussions with the property

owners, the Noxious Weed Program staff understood that they were treating the thistle plants by mechanical means. The Noxious Weed Program found and treated only a handful of rosettes at the Old Fort Road site.

Klamath County and Noxious Weed Program shared responsibility for treatments of Taurian thistle in 2016. The populations by Hwy 140 and Old Fort Road have not expanded and are checked several times a year.

The Taurian thistle is a vigorous biennial, or short-lived perennial plant with coarse, spiny leaves and conspicuous spiny-winged stems. The plants are a nearly florescent lime-green in color with large, mostly singular flower heads at the terminals of the main and side stems. The bright purple flower heads are 3 to 4 inches in diameter. The heads consist of numerous spiny-tipped bracts resembling an artichoke before the bud opens. The leaves are typically covered with short, sticky-glandular hairs, acutely triangular, with 6 to 8 pairs of spiny-toothed lobes. Taurian thistle seedlings typically appear after the first fall rains and develop into large rosettes the next growing season. From this rosette and taproot an 8 foot tall plant develops. Dead stems can persist into the next season with spines attached. Taurian thistle reproduces only by seed. Most seeds germinate in the fall but can germinate throughout the summer. Buried seed can remain viable in the soil seed bank for at least seven years and possibly to 20 years or more. Wind, water, animals, and vehicles can assist in dispersal of seeds.

Northeast Region

By Mark Porter

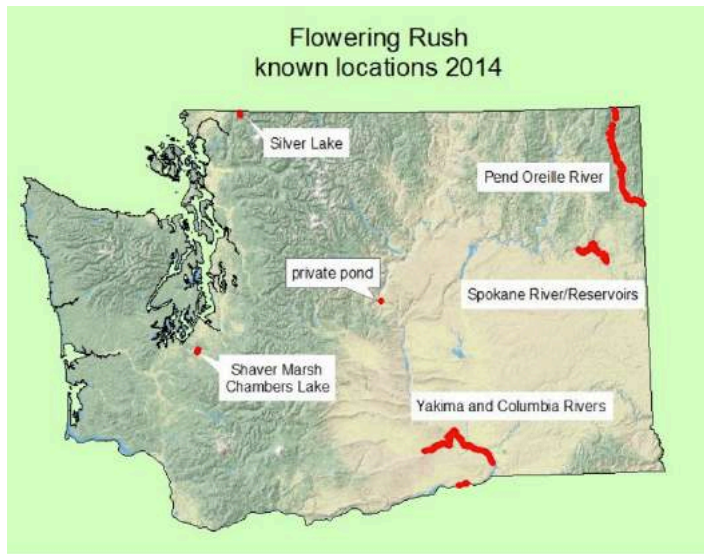
Flowering Rush, *Butomus umbellatus*

Flowering rush is an escaped ornamental aquatic plant that invades and dominates mud-bottomed slow waters up to 20 feet of depth.



East Bay, Flathead Lake, MT
Well established flowering rush (*Butomus umbellatus*) infestation
Photo by Alvin Mitchell, Salish Kootenay College

Flowering rush invading Flathead Lake in Montana.



Distribution of flowering rush in Washington.

Numerous small sites of the plant have been found downriver of Wallula Gap in the Columbia River over the last 3 years. Upriver of Wallula Gap, the Army Corps of Engineers (ACE) has mapped quite an extensive population. The source of flowering rush in the Lower Columbia is from infestations in the Yakima River floating downriver.

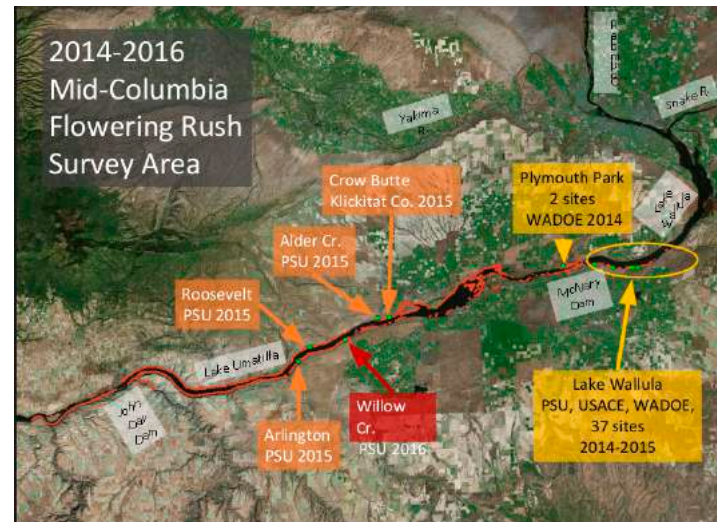
Flowering rush is an A-listed weed in Oregon due to the potential risks it poses to all waters and irrigation channels of the state. Currently, it threatens the Columbia River's:

1. Endangered salmon smolts as they migrate downriver
2. Extensive irrigation systems
3. Water quality
4. Recreation

Flowering rush is tough to kill with herbicides, which makes the already challenging issue of aquatic herbicide treatments in a free flowing river even more challenging. The Army Corps of Engineers that manages the waters of the Columbia, does not have the legal ability (NEPA and consultation are in process) to use the effective herbicides at the scale it would need to make them a useful tool in control efforts. Biocontrol research is underway for flowering rush with at least one potential agent showing promise. However, the impact of the agent remains undetermined until it has been established in our environment for a number of years. Also, it will be years before we know if the agent will pass the scrutiny of the regulatory agencies. Manual and mechanical means of control are the only available tools at this time. However, both are very expensive to accomplish.

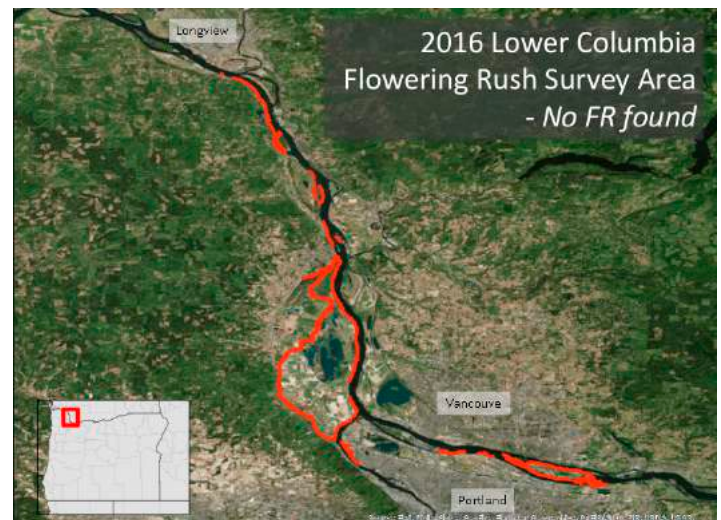
Oregon State Weed Board (OSWB) funded grants to Portland State University's Center for Lakes and

Reservoirs to do early detection surveys on the Oregon side of the Columbia between in 2014 and 2016. Tandem surveys on the Washington side of the Columbia were funded by WSDA (Washington State Department of Agriculture) or were completed by Washington State Department of Ecology (WSDOE). Surveys began in the McNary Pool (Lake Wallula) in 2014 and extended into the John Day Pool (Lake Umatilla) in 2015 and 2016, and downriver of Portland in 2016. So far, populations below the Wallula Gap are still small and limited to the pools of the John Day and McNary dams. No sites have been found below the John Day Dam.



Mid Columbia River Flowering rush survey.

All known sites in the McNary Pool were treated using a manual removal method, called Diver Assisted Suction Harvest (DASH), and/or were covered in 2015. This year, Noxious Weed Program and ACE staff closely monitored the results of those treatments. Initial monitoring found that there was no flowering rush at 86% of the sites and there was better than a 99% reduction in the area covered by flowering rush



Lower Columbia River Flowering rush survey.

between years. However, when managers returned later in the summer to cover the remaining plants (DASH was not funded in ACE's 2016 budget) a significant number of new plants were found at the larger sites. It is likely they had been missed during initial surveys because surrounding vegetation was so thick. That vegetation had died back during the second survey. Even so the reduction in biomass across all sites either went to zero or an estimated 1-2% of what had been there the year prior. No new plants were found at smaller sites. Disappointingly, the ACE did not have the resources to cover or treat the plants discovered in 2016 late summer monitoring. It is hoped that Diver Assisted Suction Harvest will be employed on the sites in the McNary Pool in 2017. Downriver of McNary Dam in the pool of the John Day Dam ACE and Noxious Weed Program weed managers hand pulled and covered all seven of the known sites.

Noxious Weed Program and Washington State weed managers continue to co-facilitate the Lower Columbia River Flowering Rush Work Group (now over 50 members). The Work Group was established to help coordinate treatment efforts throughout the area, clarify the known research about the ecology of the plant, share control methods, evaluate the plant's potential impact to Columbia River water and fisheries resources, help to shorten consultation processes, and to identify funding and policy needs for managers.

In late 2016, Work Group partners led a tour to the McNary Pool and the area near the mouth of the Yakima River to demonstrate the scope and potential impact of the problems that flowering rush might cause. Participants included State Senator Hansell and his staff, as well as staff from US Senator Wyden's office, a representative of the Confederated Tribes of the Umatilla Reservation and a staffer from the Columbia River Inter Tribal Fisheries Commission. Legislators are committed to support action and seek funding for control work. The tour also resulted in the Columbia River Inter Tribal Fisheries Commission writing a letter to the Army Corps leadership encouraging management of flowering rush in the Columbia.

Some Work Group partners helped write and submit a grant proposal to the National Fish and Wildlife Foundation to form a CWMA that looks to address flowering rush at a regional level in the entire Columbia River system. That grant has been funded and work will begin in 2017.

Plumeless Thistle, *Carduus acanthoides*

Plumeless thistle is an aggressive spiny biennial with a very limited distribution in Oregon. The original site was discovered about 20 years ago in Grant County. Grant Weed Control intensively manages those sites each year with help from OSWB funding to reduce plant density and to maintain containment. Eight net



Plumeless thistle flowers.

acres were treated in Grant County this year versus 20 in 2015.

In Wallowa County, six plumeless thistle sites were discovered five years ago. Noxious Weed Program staff treats all of those sites annually. Four sites had no plants, one site had only had one plant, and another had one small patch with about 10 plants.

A local rancher discovered a seventh site. He clipped and burned

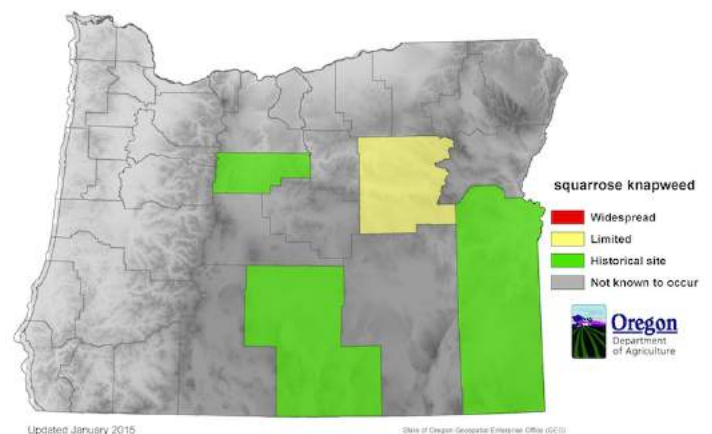
all the seed heads and the area was later treated with residual herbicide. Some of Wallowa County's sites are in immediate proximity to Spalding's Silene, *Silene spaldingii*, an endangered plant. Containment and eradication of this plant is important to rangeland health and agricultural production but also to prevent any threats it may pose to Spalding's Silene. No seed production happened at any site. Total net acreage treated this year in Wallowa County was 0.01 ac.



The only plumeless thistle plant at a historic site in Wallowa County.

Squarrose Knapweed, *Centaurea vergata*

Squarrose knapweed is an aggressive invader of dry rangelands. It is an allelopathic plant and can outcompete native and desirable forage species. Its



seeds last many years in the soil. The plant is not palatable to livestock or wildlife. Squarrose knapweed is very hard to see until it grows in thick patches making it hard to survey for.

Squarrose knapweed was discovered in Grant County in 1988. Three other sites were also found in Central and Southern Oregon counties but those have since been eradicated.

As with plumeless thistle, Grant Weed Control (with the support of OSWB funding) manages this population to reduce and contain its population. Almost thirty years ago, the plant dominated about 20 acres of ground that were scattered over 140 acres. Currently, the project area encompasses a total of 3,200 acres. In 2004, Grant Weed Control treated 15 net acres of squarrose knapweed. Consistent treatment each year since then has reduced the infested area to 4.5 acres in 2013, 2.25 acres in 2014 and 1.25 acres in both 2015 and 2016. Reductions of squarrose knapweed populations allow for healthier rangelands that provide livestock forage and habitat to a variety of wildlife as well as protect rangelands that have never been infested. It has been noted that the knapweed seed head weevil that was introduced into the area as a biocontrol of diffuse knapweed also attacks this plant.

Thanks to the stewardship of landowners and the diligent efforts of weed managers in northeastern Oregon, very few people even know that squarrose knapweed exists in the state. This is an early detection and a rapid response program that has been maintained for nearly two decades - an example that shows commitment is really the key ingredient to successful weed management.



Orange hawkweed flowers.

Orange Hawkweed, *Pilosella aurantiacum*

Orange hawkweed has a beautiful flower but is another very aggressive invader of eastern Oregon rangelands. It tends to colonize deeper soiled areas with higher soil moisture—often riparian meadows and our most productive forage production sites. Only three small sites of Orange hawkweed are known in northeastern

Oregon. Two are historic sites in the Wallowa Whitman National Forest (WWNF) and the third was discovered in the town of Wallowa last year during meadow hawkweed inventories funded by the Oregon State Weed Board.

A historic record of Orange hawkweed in Morrow County was found last year spring in the archives of Weed Mapper. Inquiries into the origin of this site revealed a herbarium sample of Orange hawkweed from the mid 1990's.

However, no data about the size of the site or any subsequent treatment could be found. A field investigation by Morrow County, Noxious Weed Program and Umatilla National Forest staff was not able to verify the presence of hawkweed where the record indicated it to be. Further inventory is planned for 2017.



Herbarium specimen of orange hawkweed.



Orange hawkweed survey crew in Morrow County. Umatilla National Forest Staff and Morrow County Weed Supervisor Dave Pranger.

Ravenna Grass, *Saccharum ravennae*

Ravenna Grass, was listed as an A-rated weed by the OSWB in 2015. It is a large ornamental grass.



An ornamental Ravenna grass plant in Boise, with a propensity to spread by seed and invade mesic and riparian sites. (Helen Porter as scale.)

At the time of listing the only known site in NE Oregon was at McNary Dam in a wildlife area managed by the Army Corps of Engineers. Noxious Weed Program staff treated that entire site and new plants were found in the shade of thick willow stands, marshy areas with high percent of other vegetative cover, and in dry big sage brush plant community.

Monitoring revealed glyphosate treatments



Feral Ravenna grass at McNary Dam.

from 2015 had a high success rate. Finding and treating newly germinating plants and seedlings will be a challenge because they are hard to find among competing vegetation. Ravenna grass appears to stay greener longer than most of our competing vegetation making late season treatments more useful.

Malheur County has several sites. Most of these were in ornamental plantings and had not

escaped. However, one site in particular had spread out of a yard and onto the banks of an irrigation ditch. The Malheur County Weed District is working with area landowners to control seed production and the removal of the plant from ornamental plantings. Ravenna grass may continue to be a problem in Malheur County as long as the plant remains unlisted in nearby Idaho thereby providing a commercial source of plants for SE Oregon residents.

Casual observations suggest that Ravenna grass is an uncommon yard plant in urban areas on the west side of Oregon. No movement away from the original planting sites has been noted to date.

Hoary False Alyssum, *Berteroa incana*

Hoary false Alyssum was listed as an A-rated weed by the OSWB in 2015 along with Ravenna grass. It can function as an annual or perennial and germinates most anytime moisture allows.

The only known site in NE Oregon is near the town of Wallowa where Hoary false Alyssum has been a



All stages of growth of Hoary alyssum at one site at one time requiring multiple treatments per year.

significant weed in an abandoned hayfield and across the road in a neighboring pasture. The plant was listed as a noxious weed by Wallowa County in 2004 and was intermittently treated since. Noxious Weed Program staff took over at the site in 2014 performing biannual treatments. Noxious Weed Program staff broadcast treated a total of three acres over the 30-acre site in July of this year. A commercial applicator also did an acre or so of follow-up treatment late in the season as young plants became more visible. Monitoring revealed that some plants treated in July did not die but only seemed to turn yellow and still formed seed. This phenomenon has been observed in Montana as well. Seed viability is questionable on these plants but to ensure a better kill in 2017 we plan on using the highest herbicide rates allowed for summer spot treatments and then a broadcasted residual treatment in the fall using chlorsulfuron to prevent germination the following spring.

Northeast Region Biological Control

Biocontrol activities were limited this year due to personnel changes at the Noxious Weed Program and APHIS and to commitments of Noxious Weed Program Regional staff to federal treatment contracts. Monitoring was generally opportunistic while working other projects.

Knapweeds

Spotted knapweed, *Centaurea stoebe*, is the weed that conquered Western Montana. It is found scattered



Larvae of the sulfur knapweed root moth and a seed head weevil, at a site near Joseph.

around NE Oregon but is being treated aggressively in most areas with herbicides and biocontrol agents. There are eight agents that are active in attacking spotted knapweed in the region including three seed head flies, three seed head weevils, and a root-boring moth.

The impact of these agents combined with active chemical management may be why spotted knapweed is not as pervasive in Oregon as in Montana. Four releases of the spotted knapweed seed head weevil, *Larinus obtusus*, were made in 2016. This weevil grazes on the knapweed leaves as an adult and feeds on the seeds as larva. Staff released two batches of the agent



Weevils in container, starting their journey from Enterprise to the Steens Mountains.

in the Grande Ronde River area in Union County in the I-84 corridor, one batch in Mormon Basin and a batch on the North Powder River in Baker County near Bridgeport. Noxious Weed Program and APHIS collected over 1,000 diffuse knapweed seed head weevils, *Larinus minutus*, in Enterprise and sent them to the Steens Mountains in SE Oregon to supplement a struggling population.

Dalmatian Toadflax, *Linaria dalmatica*

Populations of the Dalmatian Toadflax stem-boring weevil, *Mecinus janthiniformis*, released over the last 10 years continue to control Dalmatian Toadflax across northeastern Oregon. As a result, weed managers have quit spraying Toadflax in almost all circumstances. Both 2014 and 15 brought about resurgences of Toadflax plants at historic sites from residual seed. However, cursory monitoring at multiple locations this year revealed that agents are still present throughout the region and that some of the major infestations of the past still have very few plants at them.

In the Snake River Corridor, Dalmatian Toadflax had invaded a McFarland's Four O'clock site. McFarland's Four O'clock is a rare and endangered plant. The stem-boring weevil has reduced the population of Toadflax so significantly on that site that managers feel that the weed no longer poses a threat to the endangered species or to the native grasslands in the area.

Whitetop, *Lepidium draba*

The long awaited whitetop gall mite, *Aceria draba* may become available in 2017 as the USFWS signed off on their consultation this last summer. The Noxious Weed Program partnered with Baker and Grant Counties and with the Vale and Baker Resource Areas of the BLM to establish four pre-release monitoring sites of representative whitetop infestations.



Erin McConnell with BLM at a pre-monitoring site near Unity.

These sites were also selected because they are easily accessed and their management is controllable making them good nursery sites for this new agent. These monitoring areas will provide pre-release data to track potential vegetative changes. Noxious Weed Program staff is in close contact with regional biocontrol staff in Idaho and Washington as well as at APHIS to ensure that agents are brought to the state the first appropriate opportunity. The Idaho Department of Agriculture's Standardized Impact Monitoring Protocol (SIMP) was used to establish the plots.



Meadow hawkweed about to bloom near Mount Emily.

Northeastern Region Projects

Meadow Hawkweed, *Pilosella caespitosum*

Meadow hawkweed management challenges managers in Union and Wallowa counties of NE Oregon because this plant has become widely dispersed and spreads quickly. Effectiveness monitoring shows treatments to be working very well but new infestations continue to be found. The ideal treatment window is at full bloom because the plant is very visible then and responds well to herbicide. Fall and early spring applications are marginalized by the plant being hard to see and/or herbicides not being as effective. The extensive cooperative effort in the region, good mapping, data management and communication make this project worthwhile. Noxious Weed Program staff spent time doing survey and treatment with partners from Wallowa County, Tri-County CWMA, the Canyonlands Partnership, and the Umatilla and Wallowa Whitman National Forests.

Union County treatment efforts were focused on outlying populations but especially on Looking Glass and Phillip's Creeks near Elgin. Also Noxious Weed Program staff worked with the Tri-County CWMA to delimit and treat an outlying Hawkweed site on the North side of the Grande Ronde Valley under the shoulder of Mt. Emily. The site had gone untreated for at least 3 years during staff transitions at both agencies. What had been a small infestation including just a few small sites became a multi-property area that required over 8 "man-days" to treat.

More survey work is needed at the south end of the area where there are many property owners. Personnel resources were overwhelmed during the prime treatment windows and therefore the Cricket Flat population of Meadow hawkweed was not treated but the Mt. Harris area was covered intensively. It may be that without an increase in funding and/or labor

resources these areas may only be treated on alternate years.

In Wallowa County, efforts focused on new inventory and treatment in the upper Wallowa Valley and on controlling infestations in the riparian areas of the Grande Ronde and Joseph Creek watersheds. The Wallowa Whitman NF finally prevailed in a longstanding court case that had limited what weed sites they could treat and the herbicides they could spray. This year, they were able to treat many sites that had not been treated for years. Sites near the Hat Point area and the upper Imnaha Watershed were given the highest priority. The Wallowa Canyonlands Partnership focused on outlying sites as top priority. Small hawkweed populations in the North end of Wallowa County near the town of Troy on the Grande Ronde and Wenaha Rivers where the Grizzly Fire devastated much of the county in 2015 received special attention.

Snake River Project

Hells Canyon is a major project area that is largely managed by the Hells Canyon National Recreation Area (HCNRA) and is mostly wilderness. Primitive and stunning, it is at the heart of one of the largest contiguous native bunchgrass communities in the lower 48 states. It is a recreation magnet with excellent white water, hunting, fishing and wilderness recreation attributes. Historic introductions of non-native plants came with settlement and livestock grazing, logging and farming. Homesteaders who plowed fields and grazed year round significantly changed a small percentage of the area and annual grasses and weedy forbs still dominate those areas. The vast and rugged landscape requires backcountry travel and needs intensive scrutiny to find, track, and treat new infestations.

The HCNRA is home to numerous noxious weed species that pose threats to the Snake River riparian

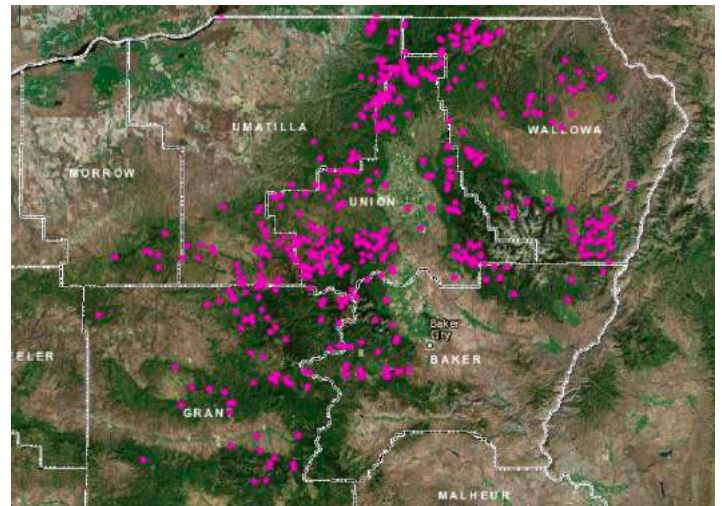


Beckijo and Sweyn Smergut-Wall taking a break from treating weeds in Tryon Creek, Hells Canyon.

areas and uplands habitats. Due to the rugged and remote nature of these grasslands, wildfires are largely allowed to burn. This gives ample opportunity for the spread of weeds like rush skeletonweed, sulfur cinquefoil and non-native annual grasses. Weeds that are actively managed throughout the HCNRA include rush skeletonweed, whitetop, yellow flag iris and purple loosestrife. Herbicide control methods are augmented with biological control agents where available and appropriate. Other species of concern include Japanese knotweed, Armenian blackberry and Tree of Heaven.

One of the highest weed management priorities in the area is the containment of rush skeletonweed along the Snake River. Weed managers from several agencies annually treat many sites from the Oregon Washington State Line to the Brownlee Reservoir. Area partners that contribute to skeletonweed control in Hells Canyon include the Wallowa Whitman National Forest, Tri-County CWMA, Wallowa Resources' WCP, Wallowa and Baker Counties, Asotin County (WA), the Baker Resource Area of the BLM, and Bonneville Power.

Tansy Ragwort, *Senecio jacobaea*



Tansy ragwort distribution in NE Oregon.

Tansy ragwort is an aggressive weed that is highly toxic to livestock. The plant is successfully controlled with biocontrol agents on the west side of the state. Those agents do not survive the winters east of the cascades making other means of tansy ragwort control very important in NE Oregon. Tansy ragwort is found primarily in the forested rangelands and riparian areas of eastern Oregon. Its introductions often seem to be associated with hunter camps, and occasionally with contaminated mulch or equipment.

The tansy ragwort monitoring and treatment program has been ongoing in NE Oregon for more than 30 years. Until last year, the Noxious Weed Program hired

a seasonal employee whose primary job was to revisit each of the active sites annually and treat (usually dig or pull) any plants found there. Over 1,000 small infestations were located over the years.

Most of these were single plant sites and have not reoccurred. Between 2013 and 2015, the number of active locations has dropped to less than ten per year.



Terry Reynolds at the Looking Glass tansy site.

The number of old sites that continue to support ragwort were decreasing. Funding constrains in 2016 brought an end to this position. Noxious Weed Program staff is working to create a GIS layer of all of these sites to distribute to County and CWMA's across the region so they can follow up with management.

Three large sites are known as well. Umatilla County Weed Control took over primary responsibility for the Bear Creek and Saddle Mountain Tansy infestations with support from Noxious Weed Program staff and OSWB grant funds. These areas continue to have multiple sites of the plant sprouting from the seed bank. Annual visits keep the percentage of cover and seeding rates extremely low. New staff at Umatilla County Weed District did intensive inventories this year and found several new outlying sites. These inventories will help define further delimitation surveys next year.

The Looking Glass area in Union County was the largest historic tansy site in the Region. Treatment lapsed between 2010 and 2013 when the Noxious Weed Program did not have a NE Oregon weed manager – due largely to a budget shortage. This year, Noxious Weed Program staff worked with weed managers from the Umatilla NF Union County, and private commercial timber company to treat as many of the known sites as possible but were only able to over about 50% of the area. Union County passed a weed levy in 2016 and has recently hired a new weed supervisor who will be a great asset in future delimitation and treatment efforts.

Common Bugloss, *Anchusa officinalis*

Most of the Common Bugloss populations in Oregon are located in the Imnaha River Canyon of Wallowa County. Consistent treatment efforts by the Wallowa Canyonlands Partnership for over ten years now have largely kept this population contained. However, survey and treatment efforts by Wallowa County (with OSWB funding) have detected and treated



Wallowa County applicators gather to treat Common bugloss.

a good number of sites near the town of Lostine. After an extensive inventory, Wallowa County's Vegetation Managers gathered area partners and contractors. Calling it the Wallowa Land Steward Day, nine applicators treated all know sites on multiple ownerships.

Outside of Wallowa County, the towns of Union and Baker each have small sites that County and Noxious Weed Program staff treat and monitor. In Umatilla County, common bugloss was discovered in Meacham Creek in a river channel restoration project during



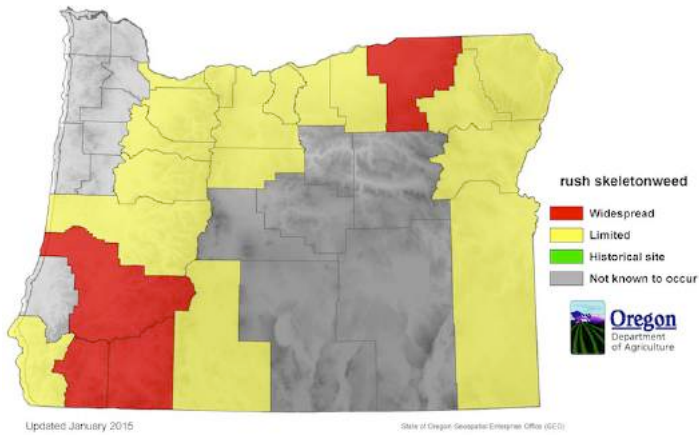
Common bugloss on the Walla Walla River.

2014. In 2014 and 2015, all plants were bagged and burned. This year, Umatilla National Forest staff treated all plants with herbicide. The Noxious Weed Program worked with Umatilla County Vegetation Department managers to locate the source of this infestation. The common bugloss was introduced to Meacham Creek from a blueberry farm on the Walla Walla River in the

Milton-Freewater area that also had a salmon habitat river channel restoration project and had provided the fill material for the Meacham Creek project. Umatilla County Weed Control and Noxious Weed Program staff worked together this summer to do initial surveys and landowner outreach in the Walla Walla River corridor to lay the ground work for delimitation and treatment in 2017.

Rush Skeletonweed, *Chondrilla juncea*

Rush skeletonweed management is a top priority for all of the eastern Oregon counties. Wallowa, Baker and Malheur counties all have significant



population on their eastern flanks and containment is the primary management mode. Umatilla and Morrow counties also work to manage skeletonweed. Both counties have significant populations in their northerly Columbia River Basin ecotype and a large seed source from Washington. However, as you move west and south in all of these counties, skeletonweed populations drop drastically and EDRR efforts are the primary management mode. Union County just found its third and fourth infestations. Union County worked with ODFW and Umatilla NF staff late this fall to delimit the new sites for treatment next year. Noxious Weed Program staff worked with weed managers from ODOT and Wallowa Whitman National Forest to make certain that all plants at both historic Union County sites were treated during the summer. The central interior counties of Oregon did not have any known sites of rush skeletonweed until this year when a site was discovered in Grant County near Ritter.



Midge and gall mite damage on rush skeletonweed plant.

That site was 0.5 net acres scattered over 14 gross acres and was treated this fall by Grant County Weed Control. Discovery and treatment of new sites in outgoing areas is critical to the containment effort. Where regular treatments have been correctly and consistently applied, managers feel that they are keeping populations steady or decreasing. Like hawkweed though, the number of sites continues to increase—so getting to all of them is the challenge. Though three biocontrol agents are present throughout almost all skeletonweed populations they are not impacting the plants consistently enough to stop the spread or decrease the dominance of

skeletonweed in some disturbed areas. Gall mites in particular can be very effective at some sites in reducing seed production and plant vigor.

The rush skeletonweed root moth, *Bradyrrhoa gilveolella*, a fourth biocontrol agent, was introduced at three sites in Baker and Malheur counties in 2012 but failed to establish. This is not surprising as there are only three sites in the entire Pacific Northwest where the moths have actually established. A release of the root moth was made in Morrow County in 2015 but no monitoring was performed in 2016 to see if agents survived. Two more batches of the moth were released in 2016. One site was near Weston in Umatilla County and the other was on the Snake River north east of halfway.



Rush skeletonweed root moth, *Bradyrrhoa gilveolella*.

Yellow Flag Iris, Iris pseudacorus, and Garlic Mustard, Alliaria petiolata

Five counties in NE Oregon are working to protect their water quality by treating these two species that invade the riparian areas and shorelines of eastern Oregon streams. They impact the native biodiversity, water flow and thereby the basic ecological function of these streams. Both species have very low distributions in eastern Oregon with the known distribution of Garlic Mustard limited to the Umatilla River Watershed. All of these projects were funded at least in part by OSWB grants.

Invasive Annual Grasses

The critical nature of managing Sage Grouse habitat and the politics surrounding it have brought invasive annual grass control (i.e. Cheat, Medusahead Rye and Ventenata) and subsequent restoration efforts into clear focus as a critical issue for all of eastern Oregon and across the west.

These invasive grasses outcompete the seedlings of native grasses thereby preventing normal succession. Further, as their dominance of an area increases they cause an increase in the frequency and intensity of wildfires. Wildfires favor the establishment of annual grasses. While the Noxious Weed Program did not implement any projects in NE Oregon that targeted annual grasses, we are working with the NRCS and other partners to ensure that coordination, cooperation and information sharing continue. Treatment types may include prescribed fire, herbicide, changing grazing regimes, and/or seeding projects.



Critical sage grouse habitat in Oregon.

A new tool became available to land managers in 2016. Biotic soil amendments were briefly available commercially as a tool to aid in annual grass repression. Sadly, they were removed from the market this year as well. While largely unproven they offered hope to managers and landowners with a tough problem.

These soil amendments, and very similar bio-herbicides that are likely to be developed soon, may be used in conjunction with standard herbicides. The soil amendment will hopefully provide enough annual grass suppression for 3-5 years after treatment that seedings of desired species will have much better chance of establishment. This is an exciting technology with potential to increase our ability to restore areas to native perennial grasses.

Special Projects in Northeast Oregon

Giant Cane Grass, *Arundo donax*

Noxious Weed Program staff is working with PGE, Morrow County Weed Control, Morrow County SWCD, private landowners, and Oregon State University Extension to monitor the control of *Arundo donax* in the Boardman Area where the plant is being experimentally grown as a potential source of biofuel for the Portland General Electric's coal-fired Boardman Power Plant.



Arundo harvest at PGE biofuel plot near Boardman.

Two fields of the three experimental fields were taken out of production and are being treated for residual *Arundo*. Noxious Weed Program staff is working with partners to change the paradigm of this current effort from a standard weed control mindset to eradication.

More effective treatment prescriptions (i.e. higher use rates of glyphosate) have been recommended and some herbicide alternatives are being tested at OSU's Agricultural Research and Extension Center this coming year.



"Turkish" thistle growing near the Snake River.

Turkish Thistle

In 2014, it was discovered that annual weedy thistle in the Hells Canyon area thought to be the Italian thistle, *Carduus pycnocephalus*, was not. Genetic testing at Montana State University and subsequent consultation with national thistle experts indicate that this plant is not a match for any thistle currently known to exist in the

United States but resembles plants documented in Turkish Botanical guides. The species has yet to be determined but is preliminarily being called *Carduus cinereous*. The Noxious Weed Program is initiating a weed risk assessment for this plant.

Wetted Thistle, *Carduus crispus*

The Wetted thistle was discovered in Wallowa County this summer. A local rancher initially reported the plant to the County Vegetation Manager as Musk thistle. Once it was realized that it was not a Musk thistle and it also wasn't a plumeless thistle, the Manager called Noxious



Wetted thistle flowers.



Wallowa County Weed Manager Ryan Oberhelman and Wetted thistle.

Weed Program staff to help identify it. Samples were collected and sent off to the OSU herbarium and to the University of Idaho for identification. Both experts agreed on the identification. Wetted thistle is only known at one other site west of the Rockies and that is in British Columbia.

Wallowa County, WCP and Noxious Weed

Program staff worked together to delimit and treat the area. Wallowa County bought any hay that was in close proximity to the weed sites and burned the bails. Wallowa County also did outreach to any county that had received hay from those fields.

Giant Foxtail

Giant foxtail, *Setaria faberi*, was found in the right-of-way of Highway 11 near Weston Oregon.

Giant foxtail was identified and reported to ODA by Professor Barbara Wilson of the OSU herbarium. Information was passed on through ODOT channels to Umatilla County and then on to the Noxious Weed Program.



Giant foxtail, *Setaria faberi*, was found in the right-of-way of Highway 11 near Weston Oregon.



Giant foxtail seed heads clipped and bagged for disposal.

A 10' x 30' road side patch was treated. Seed heads were clipped, bagged and burned. The site was treated with glyphosate and Imazapyr. This annual grass is a significant noxious weed of row crops in the mid west. This is the first report in the Pacific Northwest and was added to the ODA watch list of plant.

Education and Outreach in Northeast Oregon

Noxious Weed Program staff gave educational weed presentations at the Oregon Vegetation Management Association Conference, Oregon Interagency Noxious Weed Symposium, Northern Rockies Invasive Plant Council Conference, and at meetings of Upper Burnt River Weed District, Tri-County CWMA, and the Monument SWCD.

Regional Staff Changes in Northeast Oregon

2016 is a year of change in the weed management crew from NE Oregon. These people bring new energy and perspectives to our efforts and we look forward to improving weed control across the board! Umatilla County hired Teddy Orr as their new vegetation manager. Brian Clapp moved from Wallowa Resources where he coordinated the Canyonlands Partnership to take the job of Union County Weed Supervisor. Union County filled this job after passing a 5 year levy to fund their program (congratulations to Union County)! Wallowa Resources welcomes Lindsey Jones and Andy Marcum at the helm of the Canyonlands Partnership.

Wallowa County hired Ryan Oberhelman as their new vegetation manager in April of this year and Nikki Beachy in June as a part of their weed management team. Samantha Pack has taken the lead at Tri-County CWMA as the interim director after the resignation of Mark Lincoln.

Southeast Region

By Bonnie Rasmussen

BLM, Vale District

Three Forks Project Area

The Noxious Weed Program staff completed a summer treatment for this area in mid-June. Areas treated last year were generally clean. Leafy spurge was found growing in the vicinity of previously treated locations. Whitetop and Scotch thistle continues to crop up due to the extensive amount of seed from past infestations. Scotch thistle plants were treated along the Three Forks road between Highway 95 and the Three Forks Campground. The yellow starthistle site treated in 2013 near Grassy Reservoir was extensively surveyed and again no plants were found this season. This area continues to show serious impacts from multi year drought conditions and fires. The Noxious Weed Program crew did not revisit this area in the fall.



Pascal reseeding site.

Pascal Reservoir Project Area

Noxious Weed Program staff made multiple visits this season to the project area in the spring and fall windows. The past few years have been pretty dismal and even with some moisture the plant community still has not recovered from past few drought years. A very limited amount of yellow starthistle plants were present in the project polygons and a few border areas. Overall, plant numbers were still relatively low. No new areas of infestation were found and the rim above Jordan Creek Canyon remained mostly clean. Noxious Weed Program staff continues to coordinate with Jordan Valley Cooperative Weed Management Area to ensure known plants on adjacent private lands to the north and southeast are monitored. Visibility



Pascal treatment area following yellow starthistle treatment and removal.

and the sheer size of the gross project area continues to be a big challenge.

With winter and spring moisture there was again significant germination of Scotch thistle. In the fall treatment window several acres of rosettes were found and treated in the seeding. There was no sign of the Russian knapweed this season and the diffuse knapweed on the northeast border was again treated by the CWMA.

Rush Skeletonweed

SUCCOR CREEK



Succor Creek project area.

Noxious Weed Program crew monitored all known sites in the project area. There appears to be a resurgence of plants in 2 to 3-year old sites. The area adjacent to the campground again had several spotted knapweed plants. The creek channel has changed this season so it has improved access and treatment conditions for



Skeletonweed plant at Succor Creek site.

the site. Late summer there was a resurgence of plant growth in the dense area located on the north and east slopes of a natural fishbowl flat approximately 500 yards west of the Succor Creek Road. Staff broadcasted the dense area with rangers and searched and treated surrounding lightly populated area mostly in the fall window.

SAGE CREEK

Noxious Weed Program staff worked in the Sage Creek project area in the fall treatment window this year. This was the first treatment following the fire that burned through part of the project area in 2015.

DEVIL'S GATE/CAMP KETTLE CREEK

Noxious Weed Program crew continued to survey and treat in this project area. Limited plant numbers were located and treated in the fall treatment window.

District-Wide EDRR



Agency Reservoir.

Noxious Weed Program staff working in the Vale BLM district are always on alert for new species or known plants showing up in previously unknown locations. EDRR is a part of every hour spent working or traveling through the district. The Noxious Weed Program is also always on call for new sightings by agency staff, private citizens and other cooperators. Noxious Weed Program crew surveyed Pole Creek Road and surrounding access roads. Crew also focused on the Jonesboro area for rush skeletonweed. The treatment portion of the new Agency Reservoir's yellow starthistle site was taken over by Malheur County Weed Control. Noxious Weed Program staff continued to survey in the surrounding area and access roads for more sites.



Scotch thistle at Birch Creek.

The Birch Creek Ranch Road and Jordan Craters Road were also surveyed. Scotch thistle plants were treated near Birch Creek Ranch and perennial pepperweed noted along the Owyhee River edge in several locations. Treatments are planned for the new sites in 2017.

POLE CREEK AREA SURVEY



Pole Creek survey area.

Noxious Weed Program crew surveyed Pole Creek, Buckaroo Springs, Horse camp and surrounding access roads for invasive plants, primarily rush skeletonweed. A small amount of Scotch thistle was found on Pole Creek but all other areas were clean.



Fletcher's crossing project area.



George Petty and Rob Bank, ODA, treating spotted knapweed.



Treated Scotch thistle plants at Fletcher's crossing.

FLETCHER'S CROSSING & SAND SPRINGS

Noxious Weed Program crew completed a treatment in the Fletcher's Trail system. Musk thistle, Scotch thistle and perennial pepperweed were treated. The Fletcher's Crossing area had not been treated for a season but plant numbers were still less than the last treatment. Two RTV units and an ATV were used to access the area.

Due to extreme fire conditions, Noxious Weed Program crew was unable to access Sand Springs during the normal treatment season.

ROME, OWYHEE SPRING AND SKULL CREEK ROAD

The Noxious Weed Program also continued to work on perennial pepperweed, whitetop and Scotch thistle sites along the Owyhee river corridor and access roads east of Rome. Whitetop was treated at Owyhee Springs corrals and at multiple locations along the road. Skull Creek Road was surveyed towards Three



Dago Canyon treatment area.

Forks Hot Springs and Scotch thistle was treated along the road and at several historic sites. This area is still suffering from a multi year drought and the plant community has been severely impacted.

DAGO CANYON SPOTTED KNAPWEED

During fire-fighting efforts in the summer of 2015, a new spotted knapweed site was identified. Unfortunately, cat lines and the fire both went through a good portion of the site exasperating the situation. A fall treatment was implemented in 2015 and a follow up treatment was completed in 2016. The net site had been reduced nearly in half but the gross area continues to be large. No new plants were found outside of the known site area.

BIOCONTROL WORK

Noxious Weed Program staff focused on moving Russian knapweed biological control agents into the southern portion of the Vale Resource Area. Multiple releases of two biocontrol agents were made on BLM lands as well as supplied to the Jordan Valley CWMA for redistribution. The first, *Jaapiella ivannikova*, is identified as a bud gall midge. The larvae of this bioagent cause galls in the seed heads that act as a nutrient sink and interferes with seed production.



Russian knapweed biocontrol release site on Lower Succor Creek.

The second biocontrol agent is *Aulacidea acroptilonica* and is identified as a stem gall wasp. The wasp damages the weeds by laying eggs in the stem of the plant. Then those eggs stimulate the plant to use energy to encapsulate the foreign object, making it harder for the weeds to use that energy for other things, such as growing and spreading or making seeds.



Dry Creek Reservoir project area.

DRY CREEK RESERVOIR & ARRITOLA PLACE ROAD

Noxious Weed Program staff treated perennial pepperweed and Scotch thistle at Dry Creek Reservoir. This area is still stressed due to drought conditions and the reservoir continues to be dry.

BLM, Burns District

Steens Wilderness

This is a key habitat protection project in the Steens Wilderness area including survey, monitoring, and treatment of known noxious weed sites on private holdings and public lands. There is a large number of people who visit and enjoy recreational activities in the Steens area providing an active vector for new invaders into this relatively clean and pristine core sage grouse habitat.



Steens Wilderness project area.

In past years, the Noxious Weed Program assisted with a weeklong pack trip with BLM staff for survey and treatment of noxious weeds along the Desert Trail and in public access areas and private holdings. Due to extreme fire conditions, this project has been modified. A helicopter is now used in place of the 5-day backpack trip. The new method was significantly less intrusive, time consuming and even cheaper. Noxious Weed Program staff was unable to



Lesley Richmen with Burns BLM making a treatment near Blitzen.

accompany the crew on the helicopter portion of the trip, but a RTV trip was utilized to treat known weed sites and survey for new sites through Mud Creek, Ankle Creek to the Escobio Ridge area.

District-Wide EDRR

Noxious Weed Program staff are always on alert for new invaders and new sightings of known invaders when working in the Burns District. In addition, we often act as a conduit for information between cooperators. Some of the key projects crew assisted with this season were noxious weed control projects in the Pass Creek Drainage, Williams Creek Drainage, and Pike Creek Drainage. Rob Banks, a seasonal weed survey technician with the Noxious Weed Program, completed a fall treatment on hounds tongue located in the Page Springs Campground.

P Hill Project

The P Hill project is located southwest of Frenchglen along both sides of Highway 205. The project targets are primarily Mediterranean sage and Scotch thistle. Over the past 19 years, plant numbers have fluctuated due to weather and fire events. This season, two Noxious Weed Program crew members with a Polaris RTV spray unit and an ATV spray unit surveyed and treated the project area in spring and fall windows. Plant numbers were comparable to past year with the exception of a draw in the center of the project area that seemed to have a higher than expected plant growth.



Mediterranean sage plant.

Biological Control

The Noxious Weed Program continues to work on the Faye Canyon and East Steens diffuse knapweed sites.



Bangasternus fausti and several seed head gall flies.

Larinus minutus release site for spotted knapweed at Faye Canyon.

This year, several trips were made to the project area to monitor the presence of *Larinus minutus*.

At Faye Canyon, all biocontrol agents are present but for some reason are not having a significant impact on the target species. A new release of *Larinus* was made in a dense area of Faye Canyon.



Faye Canyon project area.

On the East Steens Mountains, diffuse knapweed plants were monitored at the Grant place and in the vicinity of Little McCoy Creek.

Plant density is the same but the plant biomass seems to be less. All released biocontrol agents are present but plants seem to remain just stunted.



East Steens Mountain, Grant Place.



Diffuse knapweed, Grant Place.



Larinus minutis, Little McCoy Creek.

A release of *Larinus minutis* was made on Little McCoy Creek.

Some *Bangasternus* and *Larinus* were present, but are not having a significant impact on the site density. The sites will again be monitored in 2017.



Purple loosestrife invading riparian habitat.

Stinkingwater Creek Project

This project focuses on control of targeted noxious weeds on the BLM and adjacent private land in the Stinkingwater Creek Drainage from headwaters to the confluence with the Malheur River. In 2016, Noxious Weed Program crew covered the entire drainage. Purple loosestrife along this creek was widespread at the east side of the irrigated ground on the Lamb ranch. Lower in the drainage, plant count was significantly lower and sporadic. Limited plants were found and treated



Purple loosestrife plants along Stinkingwater Creek.

on BLM ground south of Lamb Ranch and along the tributary just east of the ranch headquarters with some loosestrife, whitetop and pepperweed being the primary weeds treated.

Lottery Projects

Hart Mountain Weed Management

Noxious Weed Program staff treated Canada and Scotch thistle around the Hart Mountain headquarters. Noxious Weed Program staff surveyed the Frenchglen Road and found a few thistles, mostly Canada thistle. The Blue Sky and Hot Springs Roads were also surveyed and treated. The Dalmatian toadflax site, found in 2009, just west of Hart Mountain Headquarters, showed no new plants.

African Rue, *Peganum harmala*

In early September 2008, a contractor for the Bureau of Indian Affairs noted a possible infestation of African rue on tribal allotments located in the Harney Basin southeast of Burns. The Noxious Weed Program verified the plants as African rue. The initial response plan was to treat outlier sites, roadsides, barnyards, and pivots for containment and to prevent further spread. In 2008, Noxious Weed Program staff spent several weeks doing the initial site delimitation, which revealed a project area of 2,700 gross acres and 19 landowners, including the Department of State Lands, private, and tribal lands. An African Rue Cooperative Weed Management Plan was completed in 2009. This project is now largely funded by an Oregon State Weed Board Grant to Harney County and is monitored by Noxious Weed Program staff.

After monitoring revealed missed plants in 2015, Harney County modified their treatment of the project area. An initial pass with a large crew including 5 ATVs was implemented between July 18 and July 21, 2016. That was followed up a few weeks later with a smaller crew performing survey and treatment. The idea behind this was to catch plants that were either missed or that had germinated after the first large scale treatment. This worked out well and crew did catch a few more plants.

This year, Harney County treated the African rue with Capstone (triclopyr and aminopyralid) at 8 pints to the acre. Also in the mix was a generic form of Escort called SMF 75 at 1.33 ounces per acre and a 2,4-D product at 1 pint per acre. Included in the mix was a sticker (Syltac) at 1 pint per 50 gallons, a spray marking dye, and a no-foam agent. The treatment crew ran transects completing one pasture at a time. All treatments were done with a handgun with spot treatments at 50 gallons of water per acre. This high coverage rate is the only thing that has shown positive results in the past. These treatments were done between July 18-21, 2016. After completing the first

round of treatments, the crew went back out and did broad transects throughout the project area a second time during August 10-12, 2016. This second pass did result in treatments of a few more plants totaling close to 1/2 of an acre. Overall, the total population of African rue was down substantially this year. The net treatment was down to 8.5 acres.

Southeast EDRR

Noxious Weed Program worked with Harney County to survey and control orange hawkweed sites in Hines. During the treatment process, staff identified a previously unknown site of Japanese knotweed. Harney County was following up with landowners for control.



Pheasant's eye in Riley Valley.

Pheasant's eye, *Adonis aestivalis*, appears to be on the move in the Riley Valley portion of Harney County. Noxious Weed Program staff coordinated with landowners and Harney County to contain and control the increased movement of this plant. Harney County recently added it to their noxious weed list.

Noxious Weed Program staff took over a relatively new Mediterranean sage site in the Catlow Valley. The site borders BLM managed lands and is the only known site in the Catlow. A spring and fall treatment occurred on the Mediterranean sage with a small patch of medusahead rye treated in an old fire scar.



Catlow Valley, Mediterranean sage.

With the ongoing efforts to improve sage grouse habitat, the Noxious Weed Program is often at the table and consulting at many levels for habitat improvement and management.

Noxious Weed Program staff monitored two historical tansy ragwort sites and there were no new plants located.

Numerous presentations were given at meetings and trainings. Consultation was given to many ranchers,

land managers and public entities. Weed Board and CWMA meetings were attended in Grant County, Lake County, Malheur County, and Harney County.

Jonesboro Rush Skeletonweed Project

George Petty, Mark Porter and Rob Banks treated Jonesboro rush skeletonweed project area in the fall window. There was no treatment on the south side of the river due to time constraints. Old treatment areas including old railway tracks, Highway 20 corridor, DSL, BLM and Tribal lands were resurveyed and plant density was average with over all acreage still declining.



Jonesboro Rush Skeletonweed Project Area.

USFS State & Private Projects

Upper Silver Creek Watershed

The Noxious Weed Program coordinates with federal cooperators to work with private landowners in surveying and controlling of new infestations of noxious weeds in the Upper Silver Creek Watershed. Spotted and diffuse knapweed sites remained static in density. Landowners are engaged in this watershed targeting new invaders and management of medusahead rye.

Poison Creek Spotted Knapweed Project

This project is for survey, treatment, and monitoring of the spotted and diffuse knapweed sites north of Burns on the Poison Creek and Wilson Creek drainages. This site borders public lands where livestock, wildlife, and human movement provide vectors for spreading this infestation into the surrounding public lands and ultimately the forest. Plants were established along the old railway right-of-way, riparian areas along streams, roadsides and pastures. There has been significant improvement made on this infestation, but much monitoring and treatment remains as this was a very dense site and the remnant seed bank is large.

Noxious Weed Program staff took treatment back over in 2015. There were plants treated along access roads, streams, old railroad grades and pastures.

Emigrant Creek Ranger District

Noxious Weed Program staff monitored known noxious weed sites on the 41, 43, 31, 47 road network as well as the King Mountain area. There was nothing found requiring treatment. A historical Scotch broom site located of the 2810 was monitored after at least 3 years and no plants were found. A considerable Dalmatian toadflax site had existed in the past at Jordan Springs above Pine Creek.



Jordan Spring, Dalmatian toadflax site. Biocontrol agents are showing greater success in sunny location (left) as compared to shaded site (right).

No treatment has been occurring in this area, so Noxious Weed Program staff monitored for biological control presence. *Mecinus jantheformous* was recovered in previously dense stand areas.

Biocontrol agents were found widespread and severely impacting target plants in sunny exposed areas. It appears that in the dense timber regrowth that is shaded the biocontrol agents are not established or at least not being effective.

The area will be monitored again in 2017 to determine if this is due to a cycle in biocontrol agents or truly an area they will not be effective.

Yellow Jacket Reservoir

There were no new plants found for the fifth year in a row at the historical tansy ragwort site at the head of Yellow Jacket Creek. Spotted knapweed plants persist on site above and below the 37 road on private land.