



2018 Pacific Northwest Invasive Plant Council's (PNW IPC) Early Detection Rapid Response (EDRR) Citizen Science Invasive Plant Program Annual Report



Program in Action (Left to Right): Don Hardin, Group hike led by Sasha Shaw, Sandra Vahsholtz, EDRR Training Session in Bellingham WA, and Helen Hepp.

Date: February, 10, 2018

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Questions or Comments pertaining to the PNW IPC EDRR Citizen Science annual report can be sent via e-mail to info@pnw-ipc.org and further information about our program, the EDRR list, and general information about our organization can be found on our website: www.pnw-ipc.org



Mission Statement

To protect the Pacific Northwest's land and waters from ecologically-damaging invasive plants through scientific research, education, policy and an on-the-ground citizen science monitoring and eradication program.

Objectives

Facilitate communication and to promote collection and exchange of information regarding all aspects of invasive plant status, control and management;

Educate and outreach to the general public, land managers and legislators regarding the environmental and economic impacts of invasive plants;

Organize and/or support invasive plant management research and eradication efforts;

Serve in an advisory capacity for the continued needs for funding, research, management and control of invasive plants;

Provide forums where managers, researchers and the general public can share information regarding the impact, control and management of invasive plant species.

Executive Summary

Invasions of natural ecosystems by nonnative species now rank second only to habitat loss among the major threats to biodiversity (WRI 2014) and have been identified by the Chief of the U.S. Department of Agriculture Forest Service as one of the four most significant threats to our Nation's forest and rangeland ecosystems. However, land managers are currently challenged with the enormous task of identifying, reporting and removing harmful invasive plants from our treasured national parks and forests in Washington and Oregon. Our primary mission is to address these issues by educating and training local citizens to identify and understand the complex issues related to invasive species and to use their new-found knowledge and skills to take an active role in supporting the efforts of land managers

In 2012, The PNW IPC (Pacific Northwest Invasive Plant Council) developed and implemented an **EDRR (Early Detection Rapid Response) Citizen Science Invasive Plant Program** working in partnership with the US Forest Service, National Park Service, the WA Department of Agriculture and other local agencies, with funding from the National Fish and Wildlife Foundation and the WA Department of Agriculture. Since that time, we have partnered with over 30 local, state and federal agencies, other non-profits and hundreds of volunteers in an effort to detect and eradicate populations of priority invasive plants from Washington and Oregon State.

Programmatic Goals:

- Increase public awareness of invasive plant problems by recruiting local citizens and training them to identify, report and remove invasive plants in support of land management in WA and OR
- Increase the number of acres surveyed for invasive plants on both public and private lands
- Collect information on changing distributions, abundance, and phenology of invasive plants and distribute information from local (e.g., land managers and county noxious weed controllers) to regional scales (e.g., **EDDMapSWest** an Early Detection & Distribution Mapping system)
- Support county, state and federal agencies in their efforts to reduce the number of newly emerging plant infestations in WA and OR and to reduce the costs and resources spent on invasive plant management
- Decrease threats to native biodiversity in the Pacific Northwest

We are very proud of our volunteers and their amazing conservation work! The EDRR program provides meaningful civic engagement and stewardship opportunities for concerned citizens, and the participation of our volunteers leads to the direct protection of native plants and wildlife habitat as well as the improvement of ecosystem and watershed health. Programmatic accomplishments have increased dramatically since 2012 as a result of increased outreach efforts, a greater number of training sessions offered, and the expanding scope of our geographic survey region. Survey efforts focus on target trails in six national forests (Olympic, Gifford Pinchot, Mt. Hood, Mt. Baker-Snoqualmie, Willamette, and the Okanogan-Wenatchee National Forests), three national parks (Mt. Rainier, Olympic and North Cascades National Park), WA Department of Natural Resources, State and County Parks and other natural areas and other public lands.

In 2018, PNW IPC led 8 free invasive plant trainings for the public. Two-hundred and one people attended our training sessions and we recruited 97 new volunteers, bringing the PNW IPC's EDRR volunteer base up to 409 volunteers. A large number (45-50%) of individuals attending a training session were affiliated with county, state and federal agencies who participated in order to "brush up" on their invasive plant identification skills and to learn about current issues related to invasive plant management and control. Therefore, training sessions not only served to educate the general public but also served to educate natural resource managers working in invasive plant management. In total, volunteers contributed 526 hours of service documenting and eradicating populations of invasive plants from national forests, parks, state land and other natural areas in Washington and Oregon. These efforts resulted in 111 surveys, 308 miles hiked in search of invasive plants, 1,121 acres of land surveyed, and 514 acres of infested area being treated via manual removal and disposal. PNW IPC EDRR led 1 group hike that drew 12 participants, while 10 of our most dedicated volunteers independently organized 21 hikes following their training where they both documented and removed priority invasive plants in target conservation areas.

Acknowledgments

First and foremost, the PNW IPC would like to thank the many volunteer citizen scientists who have made a significant impact in the effort to locate and eradicate newly emerging populations of invasive plants in Washington and Oregon State. We are very proud of you and deeply appreciative of all of your time and effort!

We are also extremely grateful for the vital contributions made by our funders that supported the continued development and implementation of our program in 2018: the USFS Challenge Cost Share Program, the King County Noxious Weed Program, and Patagonia.

Section 1: Narrative Summary

Accomplishments and Outcomes 2018

The PNW IPC's action-oriented EDRR Citizen Science Invasive Plant Program aims to increase public awareness of problematic invasive plants and to educate and train volunteers to prevent, detect and control newly emerging invasive plant populations on public lands in Washington and Oregon.

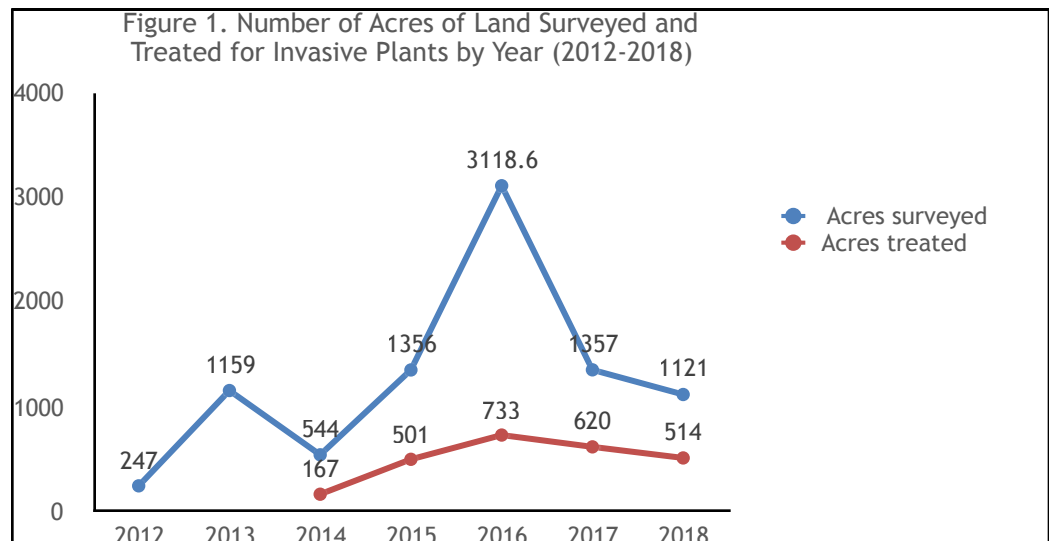
The PNW IPC's EDRR Citizen Science Program has successfully

- 1) Increased public awareness of vital issues related to impacts of invasive species,
- 2) Provided meaningful hands-on experiences for community members to be involved in conservation practices,
- 3) Increased communication and collaboration among private landowners, NGO's, and county, state and federal agencies, and
- 4) Trained citizens to survey and monitor thousands of acres of land (1,121 in 2018 alone), leading to a measurable decrease (514 acres treated by manual removal in 2018) in the number of newly established populations of invasive plants (Figure 1, Table 3).

Key long-term benefits of the EDRR Citizen Science Program include:

- 1) Cultivation of lasting stewardship values related to local and national conservation issues,
- 2) Improvement of wildlife habitat resulting from the removal of invasive plants on public lands,
- 3) Protection of ecosystem and watershed health within public lands (e.g., National Forests, National Parks, State and County Lands), and
- 4) Provides a cost effective approach (volunteer driven) to maintain biodiversity and promote ecosystem health.

In 2018, PNW IPC partnered with over 30 organizations (Table 1) and led 8 free invasive plant trainings to the public (Table 2). Two-hundred and one people attended our training sessions and 97 signed up as new recruits bringing our volunteer base up to 409 (Table 3). Each year, a large number (45-50%) of individuals attending a training session are affiliated with county,



state and federal agencies who participate in order to “brush up” on their invasive plant identification skills and to learn about current issues related to invasive plant management and control. Therefore, the PNW IPC EDRR Citizen Science Invasive Plant training sessions (which are designed to educate the general public) also provided a secondary service of educating natural resource managers and others working in the field of invasive plant management.

EDRR Citizen Science volunteers made significant, measurable impacts in detecting and controlling invasive species in WA over the 2018 field season (Figure 1; Table 3) and our program outcomes have increased dramatically in key performance categories from year to year (See Figure 1, Table 3). The program has steadily grown as a result of increased outreach efforts and training sessions, the formation of new partnerships (e.g., EDDMapSWest, King County Noxious Weed Program), and expanding the geographic scope of our survey area.

In 2018, EDRR Citizen Scientists focused their survey efforts on target trails identified by land managers in **five National Forests** (Olympic, Gifford Pinchot, Mt. Hood, Mt. Baker-Snoqualmie, and the Willamette National Forests), **two National Parks** (Mt. Rainier and Olympic), **WA Department of Natural Resources Natural and Conservation Areas** and other public lands (e.g., **State and County Parks**) in Washington and Oregon State. The majority of volunteers conducted surveys on National Forest (32%) and National Park (9%) land, while WA DNR State Land and State Parks accounted for 27% of acreage surveyed. **Figure 2** illustrates the percent of total acres covered according to land ownership. The pathway for data flows from our volunteers directly to PNW IPC, where we verify reports and immediately send our findings to land managers that are in need of this data (**Figure 3**).

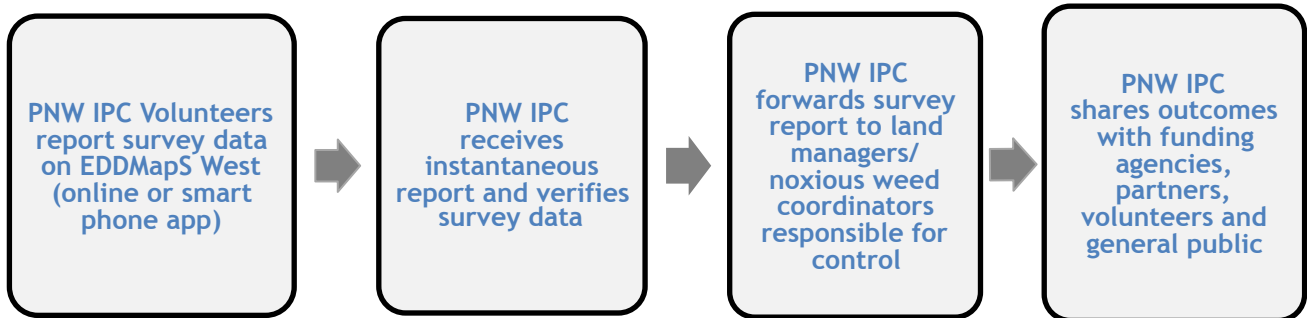
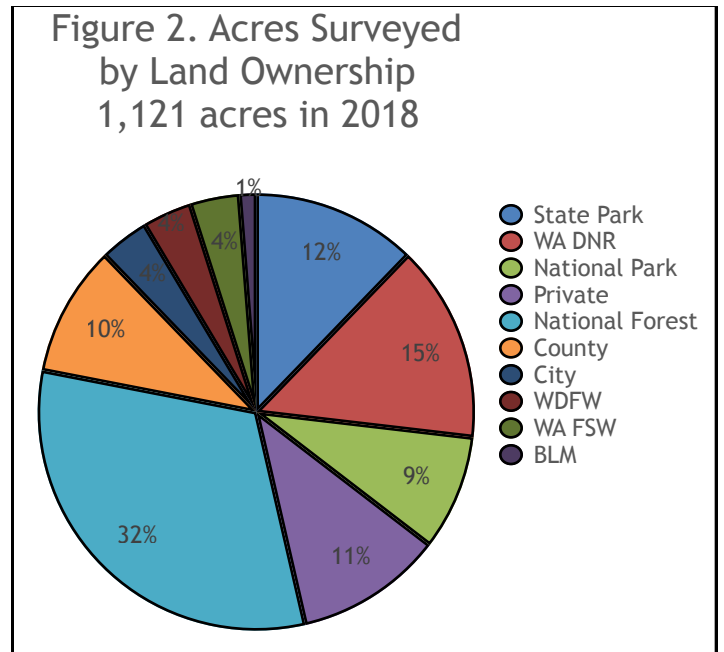


Figure 3. PNW IPC’s pathway for distribution of invasive plant data

PNW IPC Citizen Scientists engaged in significant conservation work contributing 486 hours of service in the effort to document and eradicate invasive plant species from national forests and other public lands in Washington State in 2018 (Table 3). Volunteers conducted a total of 111 surveys, hiked 308 miles in search of invasive plants while surveying 1,121 acres of public land within 8 counties (Figure 4) located in Washington. Similar to previous years, King, Pierce and Lewis county received the highest number of surveys (44%, 31% and 10%, respectively). Data from both positive survey reports (at least one EDRR invasive plant species documented) and negative survey reports (no EDRR invasive plants found) are submitted to land managers. Negative survey reports are considered just as valuable as positive survey reports because managers need to know where invasive species do not occur as well as where invasive species occur in order to guide volunteer survey efforts and

management priorities. In many cases, documented infestations were small enough that volunteers were able to manually remove them *in situ* before infestations had a chance to establish and spread. Plant material was carefully bagged and deposited off-site in the city landfill so as not to promote spread. If infestations were too large or not appropriate candidates for immediate removal (e.g., plants that are toxic or grow by extensive rhizomes) volunteers performed the survey step and left removal efforts to land managers.

In 2018, the PNW IPC, our EDRR trained citizen scientists and our partner organization, the King County Noxious Weed Program, led a combined total of 22 group hikes that drew approximately 50 volunteers. Participants of group hikes included the general public, PNW IPC volunteers and King County Weed Watchers, county and state management agencies, and each of them aided in documenting and removing priority invasive plants in target conservation areas (Table 4).



Images from Left to Right: Sasha Shaw, King County Noxious Weed Program's Education Specialist, holds up a rosette of orange hawkweed (*Hieracium aurantiacum*; Class B Noxious Weed) to show volunteers diagnostic characters (Photo Joe Neumann); Volunteers kneel down to examine an infestation of orange hawkweed in King County (Photo Sasha Shaw); A volunteer overlooks Pine Lake in the Olympic National Forest in Mason County on a group hike led by PNW IPC volunteer Dan Locke (Photo Dan Locke); and meadow knapweed (*Centaurea x moncktonii*; Class B Noxious Weed) found at the Bud Blancher Trailhead on a group hike led by PNW IPC volunteer Crow Vecchio (Photo Crow Vecchio).

EDRR Trainings: Setting Volunteers up for Success

In 2018, the PNW IPC led 8 free training sessions to the public (Table 2). Partner agencies (e.g., County Noxious Weed Coordinators, National Park and Forest Service) co-hosted and participated in training sessions and provided key information regarding local knowledge of problematic species through dynamic and interactive discussion of invasive plant issues with participants.

Training sessions are modified each year based on feedback from attendees, PNW IPC volunteers and partner organizations. In 2018, PNW IPC continued to work with partners to create specialized EDRR invasive plant lists to reflect differences in noxious weed distributions and control priorities at local scales. Each partner was asked to pick their top priority species to update the 2017 lists. As before this turned out to be a very difficult task with individual partners suggesting differing priorities for their own area. Appendix A shows the full list (25 species) of noxious weeds species covered in our 2018 training sessions. In each training session, we focused on how to identify, report, manually remove and examine the species impacts for noxious weeds chosen by partners from the master list.

Training sessions consisted of a 2.5 hour classroom session that included a PowerPoint Presentation, live plant material in pots and herbarium specimens for participants to examine in order to increase their plant identification skills. In 2018, in partnership with King County Noxious Weed Control, an optional extra 1.5 hour "weed walk" was offered after the main training session to help build volunteers' confidence in field surveying and plant identification. Weed walks occurred around the training venue taking advantage of adjacent nature spaces and trails.

The PNW IPC developed plant identification booklets for volunteers in order to aid in field identification of plants while conducting a survey. Many of our volunteers were new to plant identification and survey protocol. Trainings were designed to educate learning botanists as well as participants with extensive plant knowledge. Participants not only learned about survey protocol and how to identify priority plant species (see Appendix B for survey form), but they also learned how invasive plants negatively impact the local environment and economy and how to safely eradicate infestations. Additionally, our trainings sessions emphasize that when above-ground biomass is removed, it is imperative that sites are monitored for years to come to ensure that below-ground biomass and potential seed banks are depleted.

In 2015, we partnered with EDDMapSWest and moved to an on-line reporting system and continued with reporting on EDDMapSWest through 2018. Following training sessions, volunteers had access to the PNW IPC website (<http://www.pnw-ipc.org/edrrlocal.shtml>) which posted resources such as: the priority species list, survey forms, a tutorial of EDDMapSWest reporting, our training PowerPoint, a PDF of the identification booklet, and a list of specific trails in need of a survey in national forests and other public lands. Throughout the season, the PNW IPC assisted volunteers with tricky plant identification and survey protocol questions and verified all reports in a timely manner so that land managers received this crucial information as quickly as possible.



Images from Left to Right: **Andrew Fraser**, leads an ED RR training session in Bellingham, WA at the Whatcom County Noxious Weed Program building (photo: Laurel Baldwin); **Training Participants** examine live material and herbarium specimens in Bellingham training session; **Training Participants** study and test their plant ID skills with live samples at an invasive plant training in Seattle, WA located at the Center for Urban Horticulture (photo: Sasha Shaw); **Herbarium sheets** used as educational tools were generously loaned from the Otis Douglas Hyde Herbarium (University of Washington Botanic Gardens).

Citizens Who Hiked the Extra Mile

We congratulate each and every volunteer who has hiked a trail and turned in a survey report for us over the years. Your efforts have made a difference in the protection and preservation of native ecosystems! In our trainings we ask that individuals who sign up, to conduct at least 1-2 surveys a season. However, we have a small cadre of enthusiastic volunteers who have gone above and beyond what we have asked, dedicating much of their time to documenting and eradicating populations of invasive plants from natural areas in WA and OR. We would like to give a very special thanks (in no particular order) to: Ann Stevens, Sandra Vahsholtz, Crow Vecchio, Monty Vanderbilt. Our program is a huge success because of your efforts. You have all hiked the extra mile and we thank you!

The “Sarah Reichard Hike the Extra Mile Award”

In August of 2016, PNW IPC’s Vice President, Dr. Sarah Reichard, passed away while leading a UW Botanic Gardens floristic tour in South Africa, she was 58 years old. Dr. Reichard (Image to the right: photo by Wendy Gibble) was instrumental in forming the PNW IPC. She was a tenured professor at the University of Washington in the School of Environmental and Forest Sciences (SEFS), the Director of the UW Botanic Gardens, has mentored hundreds of eager students over the years and has served on countless boards, working groups and advisory committees related to important issues in the realm of invasive plant ecology, management, policy, and education. Her research focused on understanding the biology of invasive plants and using that understanding to develop risk assessment methods to prevent their introduction and spread. She was a passionate scientist who paved the way and created opportunities for woman in science and worked diligently to solve complex problems in the important interdisciplinary field of Conservation Biology.



The creation of this memorial fund was suggested by a PNW IPC EDRR citizen scientist who made the first contribution to kick-start the “Sarah Reichard Hike the Extra Mile the Award”. The PNW IPC Board enthusiastically embraced this idea. In 2018, the PNW IPC honors three outstanding volunteers: Sandra Vahsholtz, Ann Stevens, and Crow Vecchio who will receive gift cards to acknowledge their outstanding work.



Images from Left to Right: Sandra Vahsholtz surveying a trail in the Olympic National Park, Ann Stevens removing English holly in King County, and Crow Vecchio takes a break from removing invasive plants in Mt. Rainier National Park. Collectively, these three conservation warriors conducted 59 surveys, reported 446 new invasive plant records, hiked 236 miles of trail and volunteered 428 hours of their time searching for, reporting and removing harmful invasive plants from wilderness and other natural areas!

Partnerships Are Key to Programmatic Success

In 2018, PNW IPC partnered with over 30 organizations (Table 1). All partnerships contributed to a successful program and we are thankful for all of our new partners and continuing partners for 2018.

EDDMapsWest (our online reporting and mapping platform) developed a survey form specifically for the PNW IPC EDRR program. The partnership between PNW IPC and EDDMapSWest significantly increased the efficiency of reporting and data dissemination to land management partners.

EDDMapSWest is a national Early Detection & Distribution Mapping System and provided instantaneous reporting to PNW IPC and state and county weed coordinators. Volunteers who used online reporting could report either a positive (priority species found) or a negative (no priority species found) report. Positive reports included a record of species occurrence(s), images and other important key information to aid land managers in finding reported infestations (See Appendix B for reporting form). Once reports were uploaded on EDDMapSWest the PNW IPC receives an instantaneous message to review incoming reports. The PNW IPC reviews report details and once the plant identification was verified, land managers were forwarded the information in a timely manner (Figure 3).

The map in Figures 5 and 6 was generated by EDDMapSWest and can be accessed (along with plant location data) at <https://www.eddmaps.org/tools/query/> by selecting “PNW IPC survey” under project information at bottom of page. **NOTE:** Locations of negative survey reports from are not included on the map.

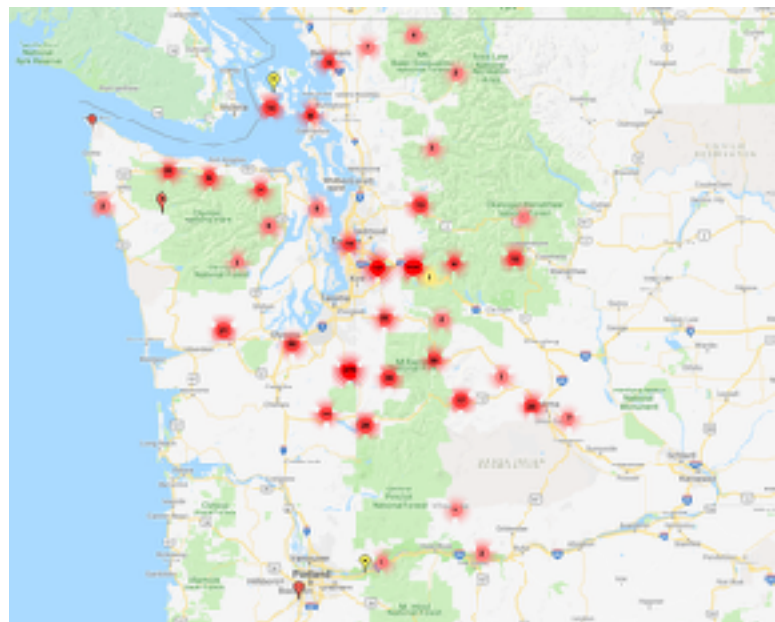
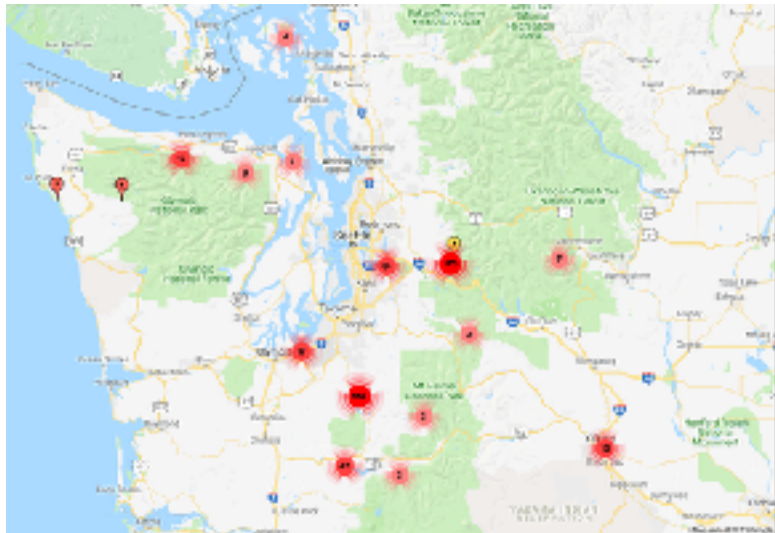


Figure 7 (right) shows a screen shot of the PNW IPC logo (circled in red on the EDDMapSWest reporting portal). Volunteers go the EDDMapSWest site: <https://www.eddmaps.org/west/report/> to report a negative (no invasive plants found) or a positive report (invasive plant(s) found). Volunteers, land managers, researchers and the general public can generate distribution maps using EDDMapSWest and import distribution data for species of interest.

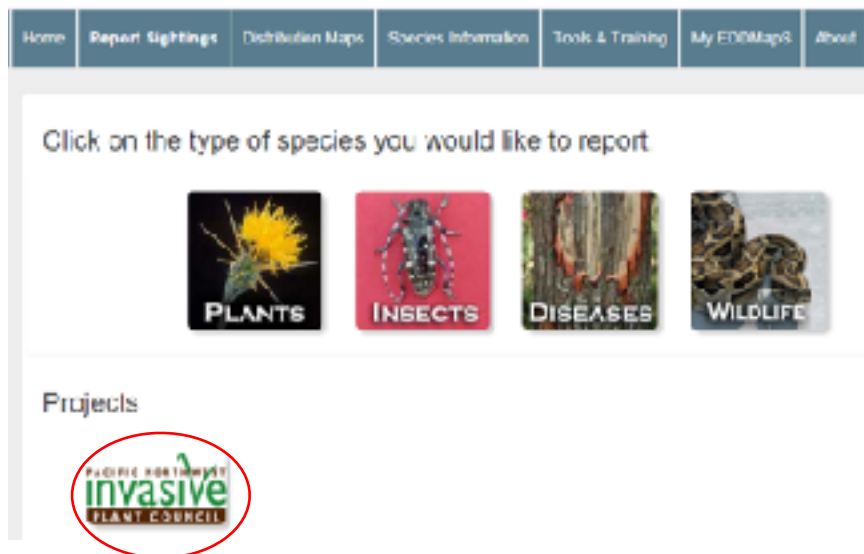


Figure 7. Screen shot of EDDMapsWest showing PNW IPC’s logo showing entry point to specialized survey form

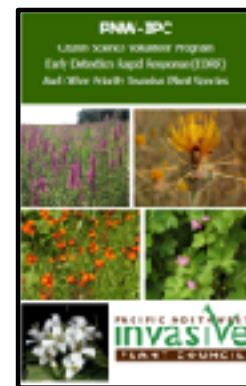
Information Sharing, Outreach and Outlets for Programmatic Findings

Annual Report

- The PNW IPC shares an annual report with partners, funders, volunteers and the general public sent out via e-mail and posted on the PNW IPC’s website: <http://www.pnw-ipc.org/>

Plant Identification Booklet

- The PNW IPC developed and distributed a specialized plant identification booklet with 2018 target species to all volunteers who sign up to volunteer (Cover Image of booklet on right).



Raw data of invasive plants documented

- All data can be downloaded from the EDDMapSWest website at: <https://www.eddmaps.org/tools/query/> by selecting “PNW-IPC survey” under project information at bottom of page. The database shows all information related to the survey records (e.g., plant name, location, county occurrence, reporter, land ownership etc.) and can be downloaded in several formats (CSV, KML, GPX, Shapefile).

PNW IPC’s “Invasive Plant Mentors”

- PNW IPC initiated the “Invasive Plant Mentor” group hikes initiative. These are group hikes led by PNW IPC Citizen Scientists who have an excellent working knowledge of plant identification and reporting skills and organize and lead hikes for fellow volunteers interested in increasing their plant ID and reporting skills.

Conferences

- Andrew Fraser presented at the WA State Weed Coordinators’ Association Annual Conference in Chelan, WA: ***“PNW IPC Early Detection Rapid Response Program”***, March 7th, 2018.

Moving Forward

For the 2019 survey season, the PNW-IPC is addressing the needs of volunteer training and recruitment through several methods. The first approach is an increase in group hikes. In previous years, the PNW-IPC along with program partners King County Weed Watchers, has organized 5-7 group hikes. In 2017, all three group hikes were arranged by the Weed Watchers, and in 2018, the large majority of hikes were organized in small groups by our “Extra Mile” volunteers.

Due to the duration and severity of wildfires that took place across Washington and Oregon during the 2018 summer season, both air-quality and landscape conditions were unfit for hiking in many regions. The Pacific Northwest region has not dealt with fires and air-quality conditions of this severity up until the last two years in recent history, and this impacted our ability to successfully organize our usual number of group hikes. Due to the continuing progression of changing weather patterns in our region, we will be “front-loading” the majority of our seasonal hikes in an attempt to avoid the more severe conditions that have been occurring in late summer. As the season progresses, we will also be working closely with our National Forest partners in anticipation of the conditions created by wildfires to ensure that our volunteers have the utmost confidence in their health and safety on our hikes.

Additionally, the PNW-IPC has added a new position and member to our team! Our new EDRR Program Outreach Coordinator started with us in March of 2019 and has been working to ensure that we are on track to meet all of our goals this season. With our increase in outreach and communications efforts in 2019, bi-weekly emails showcasing group hikes, priority areas in need of survey and plant highlights focusing on a different EDRR species will be sent out during the survey season to encourage volunteers to survey and continue with their learning process.

For 2019, the PNW-IPC is working to arrange a minimum of 1-2 group hikes per month for late spring and early summer in each workshop area. The goal is to have the group hikes the same week or as soon as possible after the workshop to help convert workshop participants into active volunteers and build their confidence in plant ID and using the EDDMapS survey system. Discussions with the King County Weed Watchers program about target areas for hikes has already begun in order to maximize resources and show a unified message to volunteers.

Workshop Lesson Plan

The current workshop lesson plans may also be overhauled to facilitate workshop attendees learning and encourage their conversion into EDRR volunteers. The current workshops can be overwhelming to volunteers due to large amount of material covered from program history, how to use the EDDMapS system to survey, and EDRR species identification. The existing material will be reorganized to present a more fluid and streamlined structure with the program history section shortened and the number of priority EDRR species covered in each workshop reduced to provide time to focus on each individual species covered to improve volunteer confidence in identifying the species.

The survey section presents an ongoing challenge due to the two difficulties of volunteer confidence of surveying in the field and using an online system to report the data. Potential volunteers come from a wide variety of backgrounds and experiences in plant surveying and computer expertise. One potential solution of this would be to create a fake survey program using cones with pictures or examples of various invasive species as part of the workshop and have potential volunteers conduct a mock survey, filling out a paper survey form. Should the workshop facilities permit it due to either wifi or computer access, this would then be an ideal time to walk them through actually submitting data though the EDDMapS system to reinforce the directions covered earlier in class. A continuation of the optional mini hikes after the trainings should also be continued where feasible with workshop partners

Volunteer Database

The development of a PNW-IPC volunteer database is integral for the future development of the PNW-IPC EDRR program. We are excited to announce that our Outreach Coordinator has recently completed this project, which will ease communications between the PNW-IPC program and volunteers. Going forward, this will also allow the PNW-IPC to better support and direct volunteer efforts and foster further growth and education for the volunteers.

Smartphone App Update

In 2016, the development of a field reporting smartphone app was identified as an important next step to facilitate field reporting of data and likely to increase participation rate. Due to staff changes at the PNW-IPC, this update was not feasible during the 2017 so the goal is to achieve this update in 2019.

Currently volunteers report the survey data in one of two ways. The most frequently used approach is for volunteers to fill out a paper survey form in the field, taking a photo of the plant(s) and uploading data from a home computer to the EDDMapSWest website. The second approach entails using the EDDMapSWest smartphone APP in the field which easily takes a picture of the plant, records the location while the user is in the field but then volunteers have to return to their home computer to upload the smartphone app information to their PNW IPC EDDMapSWest account. This is a cumbersome process because it essentially requires users to complete two steps in the reporting process. As such, in 2017 only 2 reports came in using the smartphone app. If the PNW-IPC wishes to increase smartphone submissions, a more smooth and streamlined system is required.

The majority of the data PNW-IPC receives, comes from volunteers who are planning to go surveying while hiking or kayaking. The current phone app reporting system discourages new or less confident/dedicated volunteers from reporting. Relatively few people plan to go surveying for EDRR species every time they are recreating outside. By developing a streamline reporting app, trained members of the public who may not otherwise volunteer can use their phones to report EDRR instances when they happen to run across them. This will ideally increase volunteer numbers and help locate EDRR population even sooner.

PNW IPC is currently sourcing funds to work with EDDMapSWest to develop a specialized portal on the current EDDMapSWest smartphone app so users can report in one step and data would be instantaneously sent to PNW IPC for verification and subsequent dissemination to the appropriate land manager(s).

The PNW-IPC is also looking at the possibility of developing a joint smartphone app with the Washington Invasive Species Council (WISC). WISC also partnered with EDDMapSWest to develop a smartphone app to report EDRR species in Washington. As both programs use the same online database to report data, there is rationale for fusing the two apps so volunteers in Washington have strong simple message in what app to use to report EDRR and invasive species.

Section 2: PNW IPC's Board Members and EDRR Program Officers

2018 Board Members and EDRR Citizen Science Program Officer

- **President - Steven Manning** - Invasive Plant Control Inc.
- **Treasurer - Lizbeth Seebacher**, - Washington Department of Ecology
- **Shawna Bautista** - USDA Forest Service
- **Tim Harrington**, - USDA Forest Service
- **Bill Brookreson** - Washington Native Plant Society
- **Greg Haubrich** - WA State Department of Agriculture
- **Dana Pearce** - The Uprooter
- **Special Program Officer - Andrew Fraser**

Table 1. 2018 Funding agencies, funding sources and partners organizations.

| Funding Agencies and Funding Sources | |
|--|--|
| National Fish and Wildlife Foundation | Washington State Department of Agriculture |
| Gifford Pinchot National Forest | King County Noxious Weed Program and King County Weed Watchers Program |
| Washington State Department of Natural Resources | PNW IPC Members and Individual Donations |
| PNW IPC Partners | |
| Federal Partners | |
| Gifford Pinchot National Forest | Mt. Rainier National Park |
| Mt. Baker-Snoqualmie National Forest | North Cascades National Park |
| Mt. Hood National Forest | Olympic National Park |
| Okanogan-Wenatchee National Forest | National Fish and Wildlife Foundation |
| Olympic National Forest | National Forest Foundation |
| Willamette National Forest | |
| State Partners | |
| Central Washington University | Washington State Department of Agriculture |
| Oregon State Department of Agriculture | Washington State Department of Natural Resources |
| Oregon Invasive Species Council | Washington State Noxious Weed Control Board |
| University of Washington, Botanic Gardens/ Otis Hyde Herbarium, Burke Museum and WTU Herbarium | Washington State Parks and Recreation |
| Washington Invasive Species Council | |
| County/Municipal Partners | |
| Clackamas County Soil and Water Conservation District | Klickitat County Noxious Weed Board |
| Columbia River Gorge Cooperative Weed Management Area | Lewis County Noxious Weed Board |
| Clallam County Noxious Weed Board | Pierce County Noxious Weed Board |
| Cowlitz County Noxious Weed Board | Skamania County Noxious Weed Board |
| Four County Cooperative Weed Management Area | Thurston County Noxious Weed Board |
| Grays Harbor Noxious Weed Board | Whatcom County Noxious Weed Board |
| Jefferson County Noxious Weed Board | Yakima County Noxious Weed Board |
| King County Noxious Weed Control Program | Northwest Trek Wildlife Park Metro Parks Tacoma |

| | |
|--------------------------------------|---|
| Kittitas County Noxious Weed Board | |
| NGO's and other organizations | |
| EDDMapSWest | Patagonia |
| Great Old Broads for Wilderness | PlayCleanGO |
| Invasive Plant Control | The Mountaineers |
| Mountain To Sound Greenway | Washington Native Plant Society |
| Mt. St. Helens Institute | Washington Rare Plant Care and Conservation |
| Oregon Native Plant Society | |

Table 2. Invasive plant training session date, partner who hosted the training, the number of participants and the number of volunteers recruited at trainings in 2018.

| Date | Training Co-Sponsor (Program Partner) | Training Location | No. Attendees / No. volunteer recruits |
|-----------------|--|--|---|
| May 7th, 2018 | Sasha Shaw, King Co. Noxious Weed Board | The Mountaineers Program Training Center, Seattle, WA | 33/21 |
| May 11th, 2018 | Laurel Baldwin, Whatcom Co. Noxious Weed Program; Joseph Shea, Skagit Co. Noxious Weed Program | Whatcom Co. Noxious Weed Control Board, Bellingham, WA | 20/10 |
| May 27th, 2018 | David Lebo, Westside Zone Botanist, Mt. Hood National Forest; Sam Leininger, Clackamas County Soil and Water Conservation District | Mt. Hood National Forest HQ, Sandy, OR | 29/12 |
| June 1st, 2018 | Cheryl Bartlett, Olympic National Forest | Olympic National Forest Supervisor's Office, Olympia, WA | 10/9 |
| June 3rd, 2018 | Sasha Shaw, King Co. Noxious Weed Board; Jonathan Schmitt, Mt. Baker-Snoqualmie Forest Service | North Bend Ranger Station Meeting Hall, North Bend, WA | 41/34 |
| June 4th, 2018 | Jennifer DeShong and Carol Chandler, Gifford Pinchot National Forest; Emily Stevenson, Skamania County Noxious Weed Board | Hegewald Center, Stevenson, WA | 11/5 |
| June 8th, 2018 | Malloree Weinheimer, Jefferson County Noxious Weed Board; Cathy Lucero, Clallam County Noxious Weed Board | WSU Jefferson County Extension, Port Hadlock, WA | 10/6 |
| June 14th, 2018 | Bradley Kriekhaus and Carol Chandler, Gifford Pinchot National Forest; Bill Wamsley, Lewis County Noxious Weed Control Board | Cowlitz Valley Ranger Station, Randle, WA | 23/12 |

Table 3. Project Accomplishments and outcomes by year and combined results of 2014-2018. Years 2014-2016 are shown to show program development over the years. Table does not include program data from 2012-2013.

| Unit & Description | 2014 | 2015 | 2016 | 2017 | 2018 | Total (2014-2018) |
|--|------|-------|-------|-------|-------|-------------------|
| No. of free trainings offered to public* | 5 | 10 | 10 | 8 | 8 | 40 |
| No. of people who attended trainings | 72 | 297 | 322 | 162 | 201 | 1054 |
| No. of new volunteers recruited from trainings | 33 | 120 | 105 | 54 | 97 | 409 |
| No. of volunteer hours | 678 | 1,953 | 1,787 | 685 | 526 | 5,629 |
| No. of partnering organizations | 18 | 25 | 30 | 30 | 30 | 73 |
| No. of surveys conducted | 52 | 140 | 204 | 113 | 111 | 620 |
| No. of positive surveys (Invasive plants found) | 34 | 81 | 137 | 84 | 77 | 413 |
| No. of negative surveys (Invasive plants not found) | 18 | 59 | 67 | 29 | 34 | 207 |
| No. of new invasive plant records** | 55 | 252 | 421 | 509 | 486 | 1723 |
| No. of organized group hikes | 3 | 18 | 7 | 3 | 1 | 32 |
| No. people involved in organized group hikes | 10 | 74 | 44 | 18 | 12 | 158 |
| Miles of trail surveyed for invasive plants | 188 | 445 | 642 | 373 | 308 | 1,956 |
| Acres of land surveyed for invasive plants | 544 | 1,356 | 3,119 | 1,357 | 1,121 | 7,497 |
| Acres treated for invasive plants | 167 | 501 | 733 | 620 | 514 | 2,535 |
| <p>*See Table 2 for locations and training schedule **See Figure 5 for map of 2018 <i>positive record</i> locations and Figure 6 for map of records 2015-2018. Note: Records vs. Survey: <i>Records</i> refer to the total number of individual invasive occurrences across all positive survey reports. In contrast, a positive <i>survey</i> report refers to a survey that documented at least one invasive plant occurrence.</p> | | | | | | |

Table 4. 2017 Group hike locations and outcomes led by King County Noxious Weed Program and PNW IPC EDRR volunteers. A total of 18 volunteers participated in 3 group hikes offered.

| Land Ownership and Location | Date | Attendees | Outcomes |
|--|---------|-----------|--|
| Bud Blancher Trail - Pack Forest, City of Eatonville | July 29 | 12 | Volunteers surveyed 9 miles of trail and 270 acres of land. Reports by Crow Vecchio & Lisa Zander verified the presence of 7 priority species. |
| <p>* Due to the severity of wildfires during the 2018 season, both air quality and trail conditions in many areas were unsafe for large group hikes. This unfortunately deterred volunteer interest out of safety concerns and led to the cancellation of hikes that would have otherwise taken place. However, our volunteers still independently organized and carried out 21 additional small-group hikes in target conservation areas.</p> | | | |

Appendix A. 2018 Comprehensive EDRR species list. A subset (19-23) species were covered at each training session depending on regional and local priorities identified by training program partners.

| Plant Family | Scientific Name | Common Name | WA Noxious Weed Class | OR Noxious Weed Class |
|--------------------------------|--|-------------------------|-----------------------|-----------------------|
| Wetland Emergent Plants | | | | |
| Iridaceae | <i>Iris pseudacorus</i> | yellowflag iris | C | B |
| Lythraceae | <i>Lythrum salicaria</i> | purple loosestrife | B | B |
| Terrestrial Plants | | | | |
| Apiaceae | <i>Heracleum mantegazzianum</i> | giant hogweed | A | A |
| Aquifoliaceae | <i>Ilex aquifolium</i> | English holly | Monitor | Not listed |
| Asteraceae | <i>Centaurea diffusa</i> | diffuse knapweed | B | B |
| Asteraceae | <i>Centaurea x moncktonii</i> | meadow knapweed | B | B |
| Asteraceae | <i>Centaurea stoebe</i> | spotted knapweed | B | B |
| Asteraceae | <i>Centaurea solstitialis</i> | yellow starthistle | B | B |
| Asteraceae | <i>Hieracium aurantiacum</i> | orange hawkweed | B | A |
| Asteraceae | <i>Hieracium caespitosum</i> | yellow/meadow hawkweed | B | B |
| Asteraceae | <i>Hieracium pilosella</i> | mouse-ear hawkweed | B | A |
| Asteraceae | <i>Hieracium lachenalii</i> | common hawkweed | B | Not listed |
| Asteraceae | <i>Senecio jacobaea</i> | tansy ragwort | B | B |
| Boraginaceae | <i>Cynoglossum officinale</i> | houndstongue | B | B |
| Brassicaceae | <i>Alliaria petiolata</i> | garlic mustard | A | B |
| Fabaceae | <i>Ulex europaeus</i> | Gorse | B | B |
| Geraniaceae | <i>Geranium lucidum</i> | shiny geranium | B | B |
| Geraniaceae | <i>Geranium robertianum</i> | herb Robert, stinky Bob | B | B |
| Lamiaceae | <i>Lamium galeobdolon</i> | yellow archangel | B | B |
| Polygonaceae | <i>Fallopia x bohémica</i> (syn. <i>Polygonum x bohemicum</i>) | Bohemian knotweed | B | Not listed |
| Polygonaceae | <i>Fallopia japonica</i> (syn. <i>Polygonum cuspidatum</i>) | Japanese knotweed | B | B |
| Polygonaceae | <i>Fallopia sachalinensis</i> (syn. <i>Polygonum sachalinensis</i>) | giant knotweed | B | B |
| Scrophulariaceae | <i>Buddleja davidii</i> | Butterfly bush | C | B |
| Thymelaeaceae | <i>Daphne laureola</i> | spurge laurel | B | B |

Appendix B. 2017 EDRR field survey data sheet (Adapted from data sheet created by Sasha Shaw at the King County Weed Watcher's Program).

| Pacific Northwest Invasive Plant Council's EDRR (Early Detection Rapid Response) Survey Form | | | | | | | |
|---|--|--|--|---|--|---|--|
| Please return completed form to PNW IPC, University of Washington, Box 354115, Seattle WA 98195 OR e-mail to pnw.ipc.org@gmail.com OR submit field survey information ONLINE at: http://www.eddmaps.org/west/ (use PNW IPC EDRR Survey Form portal on EDDMapSWest page) | | | | | | | |
| *Land Ownership (e.g., Olympic National Forest, DNR, USFS) | | *County (e.g., Clallam) | | * Name of area surveying (e.g., The Brothers Wilderness Area) | | | |
| *Name of Surveyor(s): <u>list all participants</u> | | | | *Trail or Site Name: | | | |
| *Total Miles of Trail Surveyed: | | *Survey Date: | | Wilderness Area?: Yes or No (circle one) | | | |
| Total Area Surveyed: (acres, if known) | | Trail Start Point (Lat/Long) GPS <u>or get</u> coordinates from EDDMapSWest: | | | | | |
| *Volunteer Hours: (survey hours = total travel time to and from site + survey time in field + data entry time multiplied by (x) the number of surveyors) | | | | | Travel Miles: (driving distance to/from site) | | |
| Survey Notes: | | | | | | | |
| * Required fields | | | | | | | |
| *Plant Name (e.g., shiny geranium or <i>Geranium lucidum</i>) [At least one photo required for verification] | *Plant Location Latitude DATUM NAD83 or WGS84 in decimal degrees (e.g., 47.57982) | *Plant Location Longitude (e.g., -122.32482) No GPS? Use "Map it" function on EDDMapSWest | *Plant Growth Stage(s) (circle all stages that apply) Veg, Bud, Flower, Fruit, Releasing Seed | *Total Area of Infestation (record units e.g., sq. ft., acres) | Method if Controlled (e.g., cut flower/fruits, pulled plt.) | *Habitat (e.g., forest, riverbank, roadside) | Notes (e.g., if controlled how much area and/ or # of plants did you treat, is plant dead?, other observations?) |
| | | | Veg Bud Flower Fruit Releasing Seed | | | | |