



2007-Sekiu waterfront-pretreatment



2014-Sign of success!-Sekiu waterfront sans knotweed

2014 Olympic Knotweed Working Group

**Report Prepared by
Clallam County Noxious Weed Control Board**

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EXECUTIVE SUMMARY

Project Goal

The goal of this project is to protect the natural resources, ecosystem functions and land values in the Olympic Peninsula from impacts caused by invasive knotweeds and other exotic plants that are just beginning to invade.

Project Overview

The Olympic Knotweed Working Group (OKWG) is a loose-knit consortium of governments, tribes, non-profits and private landowners, working together since 2005 to eliminate invasive knotweed in riparian habitat. The group generally meets twice a year for the purpose of sharing information and strategically planning for knotweed control across jurisdictional boundaries. Clallam County Noxious Weed Control Board (CCNWCB), as the de facto group leader, coordinates the meetings and supports the work of other group members by acquiring Landowner Agreements, distributing herbicide, coordinating projects and in some cases supplying an aquatic applicator. CCNWCB also attempts to “fill in the gaps” by controlling knotweed in areas not otherwise covered and educates the community about knotweed impacts and control. Most of our partners have sought and received independent funding. Control of knotweed and additional harmful non-native plant species continues to expand in all four Peninsula Counties.

2014 Overview

Many entities are now involved in controlling invasive knotweeds. As awareness of invasives grows, so does concern about other aggressive plants newly invading sensitive riparian areas. In response, many are adding control of other invasives to their work plans. Details of work by all groups who responded to requests for data can be found in the body of this report. Clallam and Jefferson County Weed Boards continued to coordinate and support the work of other entities in their own counties.

The Washington Department of Natural Resources again funded a Puget Sound Corps to work under Clallam and Mason County Weed Boards for several weeks, primarily for riparian weed control, including knotweed. Having crews able to treat other invasives as they found them was a great benefit. Future projects with the DNR must include funding for project planning, crew training and oversight, as well as required reporting.

In Clallam County, controlling knotweed on four rivers is mandatory. Because of the small amounts of re-growth found during last year’s treatments, we focused on two, the Sekiu and Big Rivers. We monitored and re-treated several west Clallam locations and retreated six Port Angeles area streams. The North Olympic Salmon Coalition with the Jamestown S’Klallam Tribe secured three years funding for outreach, invasives treatments, and revegetation on the Dungeness River. We assisted with knotweed treatments there as crew resources allowed. The Quileute Tribe focused treatments on portions of the Bogachiel and Dickey Rivers.

In Jefferson County the East Jefferson WCC crew, funded by the Hood Canal Salmon Enhancement Group (HCSEG), re-treated the Big and Little Quilcene Rivers and portions of the Dosewallips Rivers. Clallam County Weed Board staff re-treated Spencer Creek, and small sites in and around Quilcene and the Dosewallips River.

In Mason County the East Jefferson WCC and/or HCSEG worked on the Union and Tahuya Rivers. The Mason County NWCB and Mason PSC controlled knotweed on several streams and miscellaneous other county sites while the Mason Conservation District once again worked within the Skokomish watershed.

In West Jefferson and Grays Harbor Counties, the 10,000 Years Institute worked in the Hoh River and the Quinalt Indian Nation with assistance from 10,000 Years Institute continued treatment on the Quinalt, Queets and Clearwater Rivers in addition to Neilton. Grays Harbor NWCB assisted with landowner permissions.

2014 Accomplishments-(see detailed summary of each county page)

- In Clallam-9 entities on 16 waterways, managed more than 215 Landowner Agreements, (encompassing 543 parcels) and obtained 86 new ones. Knotweed was treated across more than 429 acres on 42 river miles.
- In Jefferson-9 entities on 10 waterways managed more than 100 Landowner Agreements (encompassing over 405 parcels). Knotweed was treated across 1643 acres on 63 river miles.
- In Mason-4 entities on 8 waterways, managed more than 205 Landowner Agreements (encompassing over 260 parcels). Knotweed was treated across 75 acres on 24 river miles.
- In Grays Harbor-2 entities surveyed 2,500 acres and treated knotweed on 44.5 river miles.
- ***These groups reported concurrently treating multiple invasive species encompassing more than 11 additional solid acres!***

Conclusions and Recommendations

Where knotweed treatments have occurred, populations are greatly reduced. Increased awareness of other invasive plant impacts has expanded early intervention efforts in many watersheds. This has generated considerable momentum that can be sustained with modest funding investments. WSDA funding has been vital to the weed board’s ability to perform a central role in these concerted and widespread noxious weed control activities.

OVERVIEW MAP OF THE OLYMPIC PENINSULA



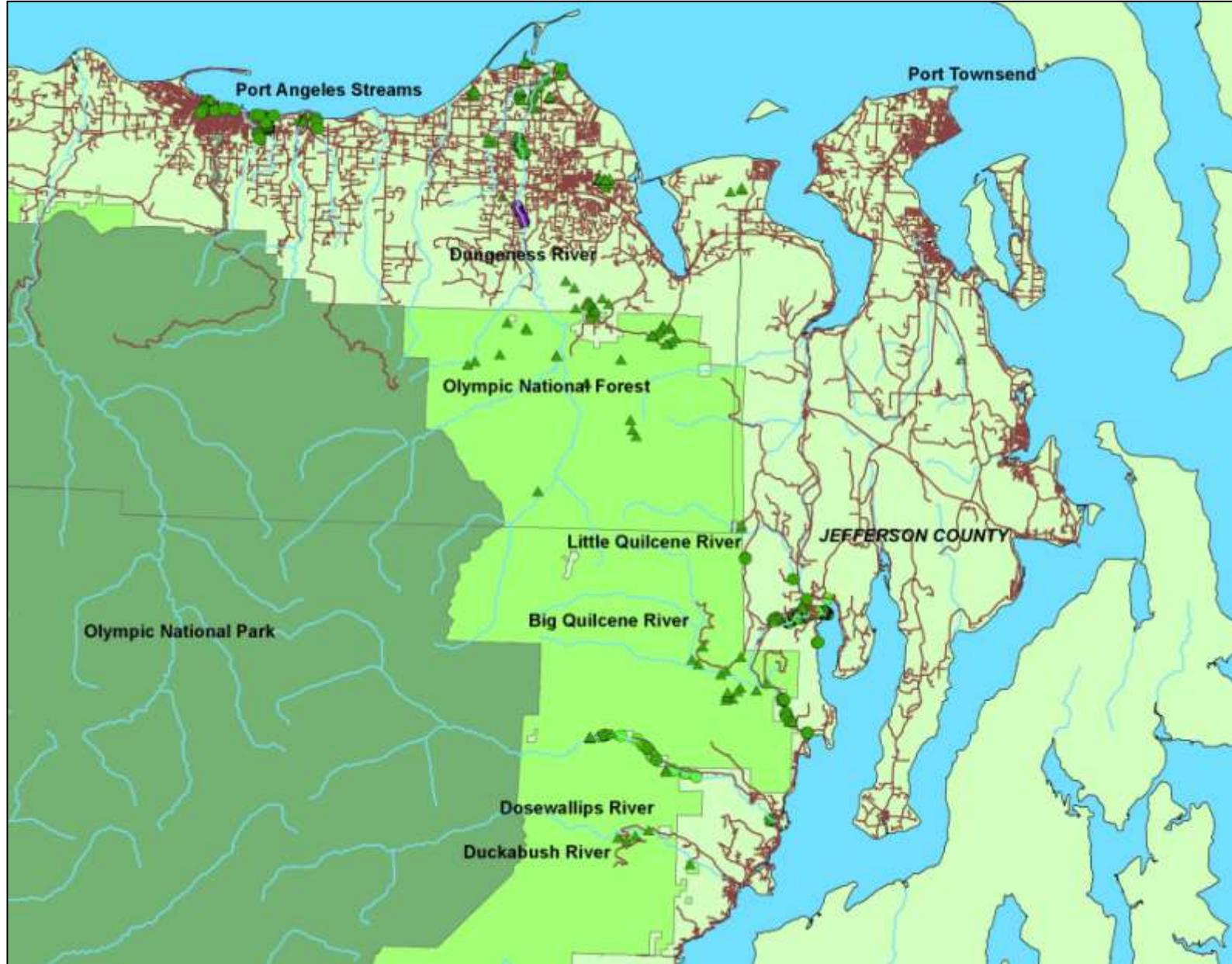
Green circles indicate 2014 knotweed treatments, triangles and squares indicate additional invasive species treatments. Brown polygons indicate the Quinault Indian Nation project area.

OVERVIEW MAP OF WEST CLALLAM COUNTY



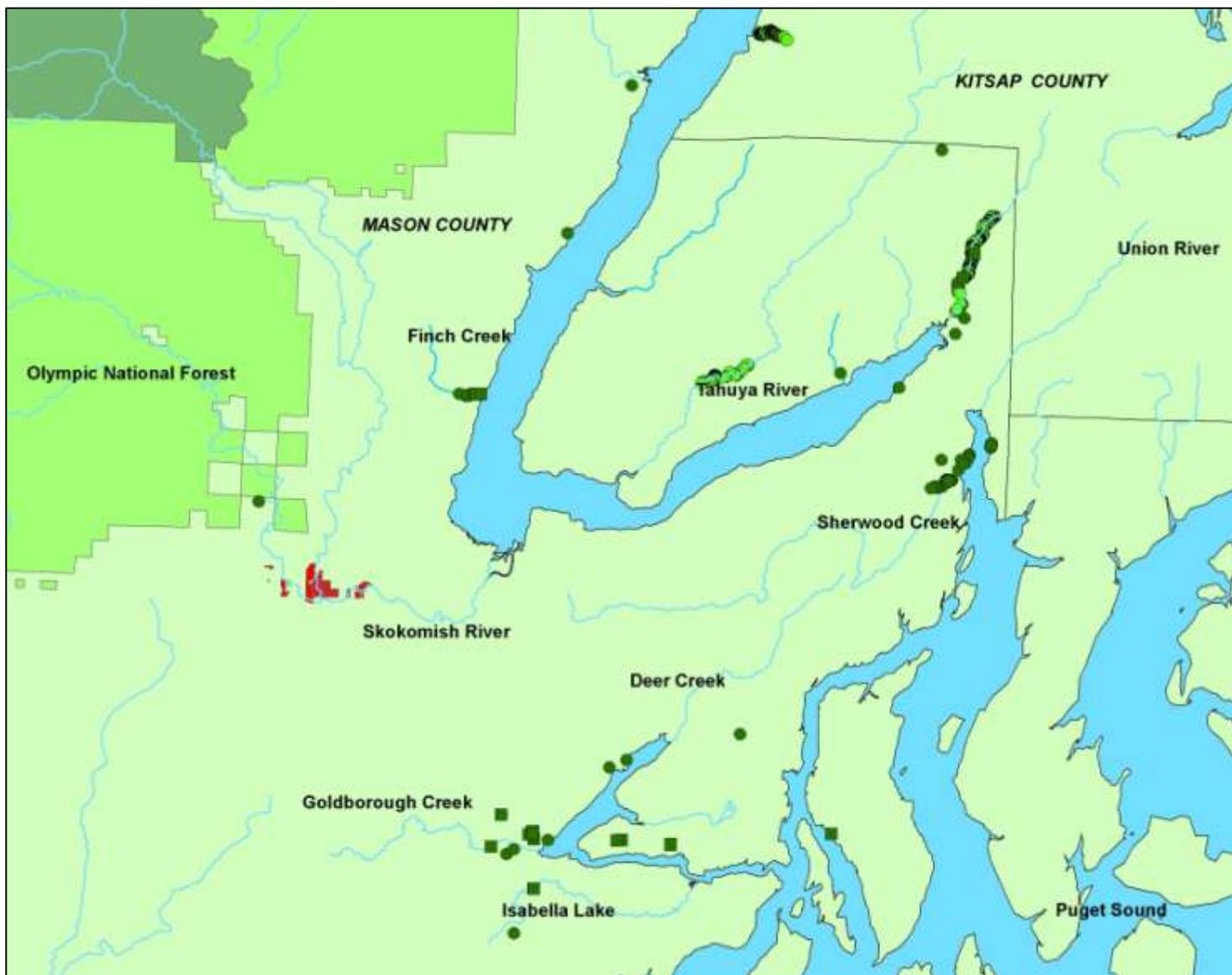
Green circles indicate 2014 knotweed treatments, triangles-additional invasive species treatments. Red lines indicate knotweed treatments by the Quileute Tribe

OVERVIEW MAP OF EAST CLALLAM COUNTY AND EAST JEFFERSON COUNTY



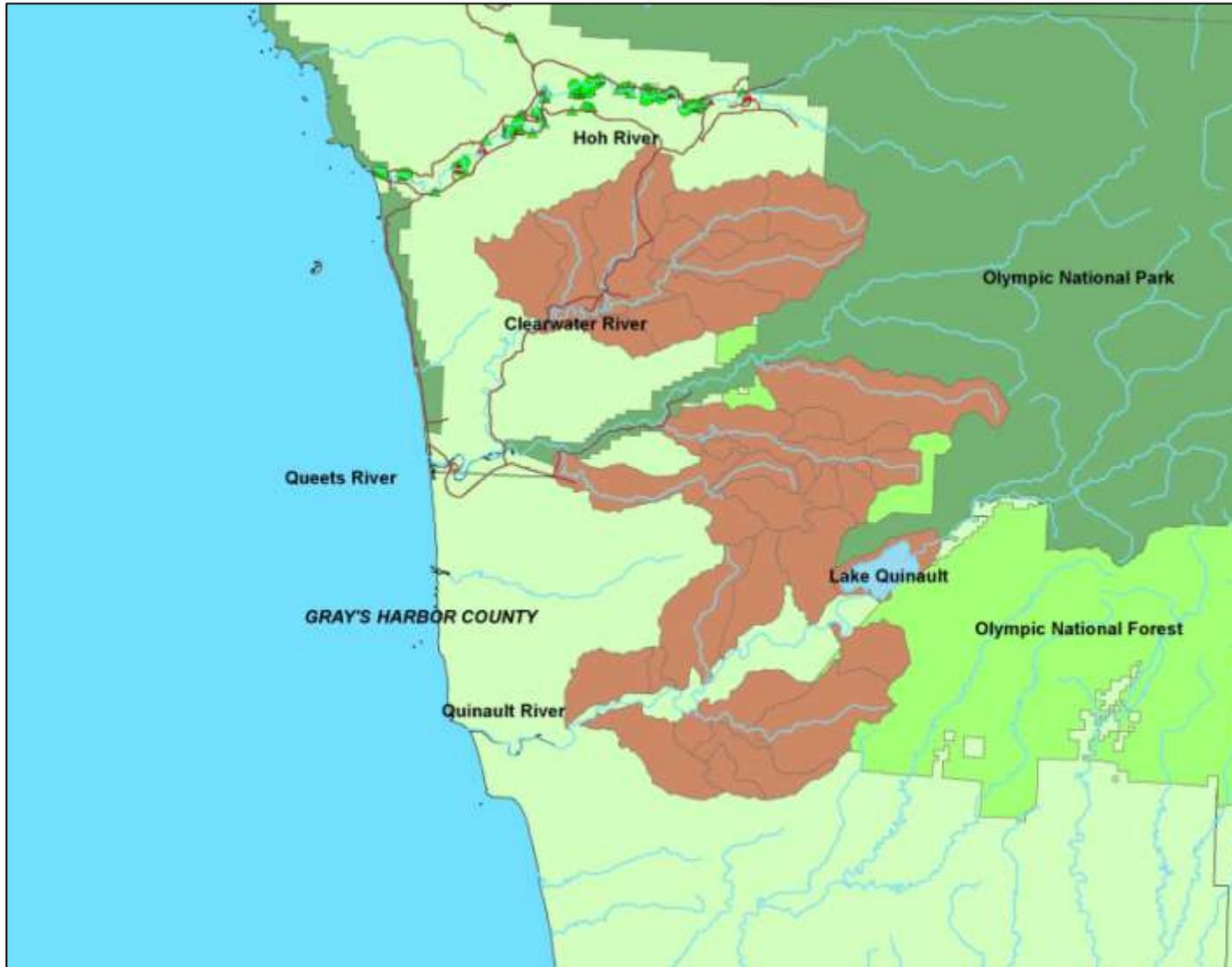
Green circles indicate 2014 knotweed treatments, triangles and squares indicate additional invasive species treatments.

OVERVIEW MAP OF MASON COUNTY



Green circles indicate 2014 knotweed treatments, squares indicate additional invasive species treatments. Red polygons indicate knotweed treatments by the Mason County Conservation District.

OVERVIEW MAP OF GRAYS HARBOR COUNTY AND WEST JEFFERSON COUNTY



Green circles indicate 2014 knotweed treatments, triangles indicate additional invasive species treatments. Brown polygons indicate the Quinault Indian Nation project area.

PROJECT DESCRIPTION

Project Goal

The goal of this project is to protect the natural resources, ecosystem functions and land values throughout the Olympic Peninsula from the negative impacts of invasive knotweed. Projects focus on riparian areas; rivers were chosen for their high significance to fish and wildlife or their natural resource value to public or tribal entities.

Project Overview

The Olympic Knotweed Working Group (OKWG) is a loose-knit consortium of governments, tribes, non-profits and private landowners, working together since 2005 to eliminate invasive knotweed in riparian habitat. The group generally meets twice a year for the purpose of sharing information and strategically planning for knotweed control across jurisdictional boundaries. Clallam County Noxious Weed Control Board (CCNWCB), as the de facto group leader, coordinates the meetings and supports the work of other group members in many ways including acquiring Landowner Agreements, distributing herbicide, coordinating projects and in some cases supplying an aquatic applicator. CCNWCB also attempts to “fill in the gaps” by controlling knotweed in areas not otherwise covered and educates the community about knotweed impacts and control. Most of our partners have sought and received independent funding and knotweed control continues to expand in all four Peninsula Counties. This report attempts to give a broad overview of work occurring across the entire Olympic Peninsula as information is provided. Because there is no other repository, we have tried to collect as much information about these projects as possible. A brief summary giving historic perspective is included, as available, to show the changes and progress this group has made over time.

2014 Overview

Throughout the Olympic Peninsula many entities have gotten involved with controlling invasive knotweeds. As awareness grows, so does concern about other aggressive plant species newly invading sensitive riparian areas. In response, many are incorporating a multi-species control strategy to their work plans. Details of work by all groups who responded to requests for data can be found in the body of this report. Clallam and Jefferson County Weed Boards continued to coordinate and support the work of other entities in their own counties.

Following last year’s successes, the Washington Department of Natural Resources again funded a Puget Sound Corps (PSC) to work in Clallam and Mason Counties for several weeks, primarily for riparian weed control, including knotweed. Having crews able to treat other invasives as they found them was a great benefit but future work days must include staff time for project planning, crew training and oversight, as well as reporting.

In Clallam County knotweed control is mandatory on four rivers, the Big, Clallam, Hoko and Sekiu. Because of the small amounts of re-growth found during last year’s treatments, we decided to forgo treatments on the Clallam and Hoko Rivers. This strategy fits with our risk assessment matrix, which helps us prioritize resource allocations. Instead we focused on the Sekiu and Big Rivers which were primarily “skipped” per matrix last year. We monitored and re-treated several west Clallam locations, such as the Pysht River, Clallam Bay and the town of Sekiu, which had been heavily infested in past years. We sought additional landowner permissions on Salt, Nordstrom and Deep Creeks to continue our progress there, but were not as successful as we hoped. We again worked on some Port Angeles area streams. The North Olympic Salmon Coalition in partnership with the Jamestown S’Klallam Tribe has embarked on an exciting three year project on the Dungeness River that includes treating invasives and replanting with natives. We assisted with knotweed treatments there as crew resources allowed and as requested. The Quileute Tribe, with less funding than in previous years, focused treatments on portions of the Bogachiel and Dickey Rivers. Restoration work on the Elwha River following dam removal includes extensive treatments of multiple invasive species, including knotweed.

In Jefferson County the East Jefferson WCC crew, funded by the Hood Canal Salmon Enhancement Group (HCSEG), re-treated the Big and Little Quilcene Rivers and portions of the Dosewallips. With the retirement of their coordinator, and chronic staffing and funding shortages, Jefferson County Weed Board did not have the capacity to assist directly with the overall joint Clallam/Jefferson program. Instead, CCNWCB coordinated landowner outreach, treatments and required reporting in east Jefferson waterways. CCNWCB crew treated as many Jefferson sites as possible especially those that already had existing permissions. Treatments included Spencer Creek, and small sites in and around Quilcene and the Dosewallips River. CCNWCB also utilized the PSC crew at its disposal to assist with heavy noxious weed infestations at the mouth of the Dosewallips River, continuing work that began there last year in conjunction with other partners.

In Mason County the East Jefferson WCC and/or HCSEG worked on the Union, Dewatto and Tahuya Rivers. The Mason County NWCB focused knotweed work on Finch and Sherwood Creeks and the town of Allyn and controlled

other invasive species with the assistance of the DNR-funded PSC crew in additional riparian sites. The Mason Conservation District once again worked within the Skokomish River watershed.

In West Jefferson and Grays Harbor County, the 10,000 Years Institute surveyed and treated knotweed in the Hoh River and several tributaries from the park boundary to the mouth. The mission in this watershed has expanded to include early infestations of additional high priority weed species. The Quinault Indian Nation continued treatment on the Quinault, Queets and Clearwater Rivers, in addition to heavily infested areas in urban areas where treatments were necessary to achieve overall control goals. The Quinaults, too, recognize the importance of treating early invaders in the course of the season and have begun to look for ways to incorporate additional species treatments efficiently. Grays Harbor NWCB assisted with landowner permissions as their limited staff resources allowed.

In all four counties the North Cascades Exotic Plant Management Team (NCEPMT) with the National Park Service treated knotweed within their jurisdiction—including the Quileute River, Big River, Lake Crescent, and Ennis Creek. CCNWCB treated all known knotweed sites on National Forest Service lands within both Clallam and Jefferson Counties.

An incredibly diverse mix of entities across the Peninsula has become part of the solution to stop noxious weed invasions. (See the 2014 Project Activity Summary by County for details of work groups who supplied their information.) Clallam and Jefferson County Weed Boards continue to coordinate and support the work of other agencies in their own counties. Both Clallam and Mason County Weed Boards managed and planned work for a DNR funded Puget Sound Corps for 22 days. The CNWCB coordinated working group meetings offering 7 license credits. Collaboration and communication between all four counties weed boards will be vital to the future progress and success of the Working Group.

2014 PROJECT ACTIVITIES

Landowner Contacts and Agreements-(as reported to CCNWCB)

Each landowner was contacted, in person, by letter/email, or phone call prior to this season's treatments.

In Clallam

- Clallam County Noxious Weed Control Board (CCNWCB) and Jefferson County Noxious Weed Control Board (JCNWCB) managed **215 existing Landowner Agreements**, (encompassing **671** parcels), obtained **25 new** landowner agreements.
- North Olympic Salmon Coalition (NOSC)/Jamestown S'Klallam Tribe obtained **56** new landowner agreements (on the Dungeness River)
- Quileute Tribe-Natural Resources (QNR)-number of landowner agreements is not available

In Jefferson

- JCNWCB-(combined with Clallam-see above)
- Hood Canal Salmon Enhancement Group (HCSEG)-managed **64 existing Landowner Agreements** (encompassing **138** parcels), obtained **1 new** landowner agreement
- 10,000 Years Institute-managed **11 existing Landowner Agreements** (encompassing **200** parcels) Information about Quinault Indian Nation (QIN) landowner contact activities is not available.

In Mason

- Mason County Noxious Weed Control Board (MCNWCB)-managed **67 existing Landowner Agreements** (encompassing **90** parcels), obtained **14 new landowner agreements**.
- HCSEG-managed **161 existing Landowner Agreements** (encompassing **213** parcels), obtained **6 new landowner agreements**.
- Mason County Conservation District-managed **20 existing Landowner Agreements** (encompassing **24** parcels)
- In Grays Harbor
- Specific information about QIN and Grays Harbor NWCB landowner contact activities is not available.

Survey and Treatment:

This list summarizes knotweed work accomplished in 2014 and reported to CCNWCB by members of the Olympic Knotweed Working Group (OKWG). It may not be a comprehensive list of activities of all OKWG partners.

It is ordered geographically starting in south-west Clallam County with the Quillayute River system and, working clockwise around the Peninsula, ending in the Hoh River system. The Project Activities by Watershed is similarly ordered. See specific watershed narrative and/or summary in Table I for more information.

- Re-treated along **7.63 miles (46.25 acres)** of the Dickey River [Quileute Nation].
- Re-treated along **13 miles (343 acres)** of the Bogachiel River [Quileute Nation].
- Re-treated along **1.5 miles (2 acres)** of the Sekiu River [CCNWCB]
- Re-treated along **10 parcels (3 acres)** of shoreline on Highway 112 and in Sekiu [CCNWCB].
- Re-treated along **3.2 miles (8 acres)** of the Pysht River [CCNWCB].
- Re-treated several sites on the Elwha River [Lower Elwha Klallam Tribe]
- Re-treated approx. **7.75 combined miles (8 acres)** along Valley, Peabody, Ennis, Lees, Morse and Bagley Creeks [CCNWCB].
- Treated **0.27 miles (7 acres)** of the Dungeness River [CCNWCB/PSC]
- Re-treated **5.54 miles (34 acres)** of the Big Quilcene River, [HCSEG].
- Retreated 0.1 miles (**1 acre**) of the Little Quilcene River [HCSEG].
- Surveyed and treated **13 miles (5 acres)** of the Dosewallips River [HCSEG/EJWCC, CCNWB].
- Re-treated knotweed along **1.7 miles (2 acres)** of Spencer [CCNWCB].
- Re-treated **9.96 miles** of the Union River and **4.1 miles** of the Tahuya River [HCSEG/EJWCC].
- Re-treated **5.25 miles (on 24 parcels)** of the Skokomish River. [Mason Conservation District].
- Surveyed and/or treated on the Quinault, Queets and Clearwater Rivers [Quinault Indian Nation]. **Project area encompasses 227,774 acres.**
- Monitored and re-treated **32 miles (1633 acres)** on the Hoh River and associated tributaries [10,000 Years Institute and Hoh River Trust].
- Treated **1.7 acres** of knotweed within Olympic National Park boundary on the Quileute River, Big River, Lake Crescent, Ennis Creek and the Quinault River. [North Cascades EPMT with NPS]
- *In Clallam and Jefferson Counties—treated land owned by **10 public entities** including US Forest Service, **4 state agencies** (WA State Parks, WA Department of Natural Resources, WA Department of Fish and*

Wildlife, WA State Department of Transportation), and 5 local governments, City of Port Angeles, the of Port Angeles, Port of Port Townsend, Jefferson and Clallam Counties [CCNWCB and JCNWCB].

Data Management and Documentation:

- CCNWCB maintained the **Knotweed Projects Database for Clallam and Jefferson County Noxious Weed Control Boards.**
- Clallam and Jefferson County NWCBs separately applied for NPDES permitting and did the necessary reporting. The 10,000 Years Institute, covered under Jefferson NWCB, did any required reporting.

Outreach and Training:

- Clallam County NWCB loaned equipment and supplies to previous workshop attendees who trained in safe herbicide use and were treating their own knotweed infestations away from water.
- Clallam and Mason Counties were given the use of a six-man Puget Sound Corps (PSC), funded by the Washington Department of Natural Resources for approximately 22 days each. Mason County was scheduled for more days, but calls to fire, interrupted service with both weed boards. The PSCs were available to assist with invasive plant control in riparian areas. Unlike the “knotweed only” focus of our crews who were funded with knotweed dollars, this crew was able to use an all invasive approach, especially for early or pioneer infestations of additional non-native plants known to be problematic. Because most of these crews were inexperienced, we provided onsite training in the use of herbicide, plant identification, and detailed work plans and maps.



Left : Clallam Weed Board staff, Clallam DNR PSC, and State Parks at Dosewallips River. Right: Crew crosses Dosewallips River prepared to treat knotweed and other invasives such as butterfly bush, broom, and tansy ragwort.

- The CCNWCB continues to coordinate meetings of the Olympic Working Group. We try to hold the meetings in various locations around the Peninsula to encourage participation from those who would not be willing or able to travel. These meetings are a forum for exchanging information and ideas, networking and pooling resources. They also help us identify future needs, data gaps, obstacles and solutions to problems. The meetings help licensed applicators accrue required education credits with topics that best serve their needs thus encouraging a higher professional standard. Meetings have expanded, attracting a more diverse audience every year. As a function of this group interaction, we have identified the need to control additional invasive plant species of special concern. Therefore, depending on the member’s need, we include information about the threats of other invasives and control measures, while encouraging a multi-species strategy.

Usually we hold a fall and a spring meeting, but this year unfortunately it was condensed into a single meeting. In November we were hosted by the Jamestown S’Klallam Tribe at the beautiful Cedar Room situated on Sequim Bay. There were over 90 attendees including representatives from 5 Native American Tribes, 6 Federal agencies, 6 State agencies, 1 State University, 7 counties, and 11 non-profits. Seven

pesticide license credits were offered for the over 40 applicators who attended. Workshop evaluations turned in by 42 attendees highly rated overall program, and felt future workshops would be valuable.



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OKWG Meeting-From top left clockwise: **Kim Williams** (Lower ElwhaKlallam) addresses a packed room about the difficulties treating invasives in the newly exposed area since dam removal on the Elwha River, **Sarah Cooke** (Cooke Scientific) teaches how to ID invasive and native wetland grasses, **Erik Johansen** (WSDA) discusses pollinator poisonings, and **Tim Miller** presents results from efficacy trials to control a variety of invasives that are moving in to riparian areas.

- Staff updated **Clallam County Weed Control Board's website**, including several pages on knotweed—the minutes of meetings of the Olympic Knotweed Working Group and many of the presentations from those meetings.
- CCNWCB staff highlighted our knotweed program and distributed information at **15 educational events**.

2014 Project Activities Summary-per County

(see Table I with watershed details by county, starting on page 49)

- In Clallam-9 entities on **16** waterways, managed more than **215 Landowner Agreements**, (encompassing **543** parcels) and obtained **86 new** agreements. Knotweed was treated across more than **429** acres on **42** river miles.
- In Jefferson-9 entities on **10** waterways managed more than **100 Landowner Agreements** (encompassing, over **405** parcels). Knotweed was treated across more than **1643** acres on **63** river miles.
- In Mason-4 entities on **8** waterways, managed more than **205 Landowner Agreements** (encompassing over **260** parcels). Knotweed was treated across **75** acres on **24** river miles.
- In Grays Harbor-2 entities surveyed **2,500** acres and treated knotweed on **44.5** river miles.
- **These groups reported concurrently treating multiple invasive species encompassing 10 additional solid acres!**

2014 PROJECT PROCEDURES

1. Surveys and Monitoring

CCNWCB surveys, monitoring and treatments took place on foot, (with the exception of the Sekiu River survey which was conducted by canoe) from August 16th through September 16th. Other entities had different treatment seasons.

2. Project Teams

Teams were typically comprised of 2-6 people and always included a licensed aquatic applicator.

- **The Quileute Nation crew**, led by Garrett Rasmussen (licensed aquatic applicator), worked on the Bogachiel, and Dickey.
- **The Clallam County NWCB crew**, consisting of Cathy Lucero (licensed aquatic applicator) Jon Clevenger (licensed aquatic applicator) Stephen Marsh (licensed aquatic applicator) Derek Schmidt (licensed aquatic applicator), and Tyler Criswell (licensed aquatic applicator) worked on the Big, Sekiu, Pysht, and Dosewallips Rivers, Peabody, Lees, Morse, Bagley, Ennis, and Spencer Creeks, associated shoreline of the Straits of Juan de Fuca, and miscellaneous Jefferson and Clallam County sites.
- **The Clallam Puget Sound Corps (PSC)**, led by Peter Allen (licensed aquatic applicator), treated knotweed on Valley and Meadowbrook Creeks, the Dungeness and Dosewallips River and surrounding areas. This crew treated multiple other invasives in additional watersheds.
- **The East Jefferson WCC crew** led by Owen French (licensed aquatic applicator), worked on the Big and Little Quilcene, Dosewallips, Union and Tahuya Rivers in collaboration with the **Hood Canal Salmon Enhancement Group (HCSEG) crew** which consisted of Julian Sammons, Tamara Gage, and Michelle Myers. The East Jefferson WCC also treated additional multiple species of invasives on the Dungeness River.
- **Mason Conservation District** with a WCC crew led by Tyler Harris (licensed aquatic applicator) treated knotweed on the Skokomish River.
- **Mason County NWCB crew** consisting of Pat Grover (licensed aquatic applicator) and Connor Cordray (licensed aquatic applicator) treated knotweed at Lake Isabella on the Hamma Hamma, and Union Rivers, Finch, Stimson and Sherwood Creeks and additional small sites in nearby waterbodies. This entity oversaw a Mason County Puget Sound Corps which assisted with knotweed treatments and multiple other invasives.
- **Total Vegetation Management and Brittlund Company crews** led by Caroline Martorano, Quinault Indian Nation staff (licensed aquatic applicator) worked on the Quinault, Queets, and Clearwater Rivers.
- **The Pacific Salmon Coalition** crew, led by Jill Silver of **10,000 Years Institute** (licensed aquatic applicator) worked on the Hoh River.
- **The North Cascades Exotic Plant Management Team with the National Park Service**, led by Dan Lucero (licensed aquatic applicator) worked on knotweed populations within the Olympic National Park, on the Quillayute and Big Rivers, Lake Crescent, Ennis Creek and the Quinault River.

3. Invasive Species Surveyed or Treated

Bohemian knotweed (Polygonum bohemicum) was the dominant knotweed species of concern. The next most common species was giant knotweed (Polygonum sachalinense). Only a few sites contained Japanese knotweed (Polygonum cuspidatum). No Himalayan knotweed was reported this year in Clallam or Jefferson Counties.

Depending on the funding source and project focus, crews treated early infestations of over 20 other invasives species such as giant hogweed, butterfly bush, reed canarygrass, herb Robert, Canada thistle, poison hemlock, and yellow archangel.

4. Data Collection & Equipment

Electronic data is collected differently depending on funding and technical capacity of each group. Some data collection systems are described below.

- A recreational grade GPS unit (Garmin 78 CX loaded with Hunt GPS maps) with track log enabled was used to keep track of null surveys (sites that crew visited but found no knotweed). Waypoints were gathered to mark sites where knotweed was found and treated.
- A Trimble GEO XT instrument, using the "Data Dictionary" developed by the Olympic Knotweed Working Group (OKWG) and using Pathfinder software for post-processing. A copy is available.
 - The Data Dictionary contains the following required fields: Agency Name, Collector, GIS Projection Reference, Site ID, Species of Knotweed, Cluster Type, Average Stem Height, Stem Count, Phenology, Site Type and Action.

- The following fields are optional: Herbicide, Surfactant, Treatment, Ownership, Canopy, Substrate, Plant Erosion Potential, Site Erosion Potential, Area, Unit, and Comments. Date, and Time fields autofilled.
- We converted waypoints collected during surveys into shapefiles, and added them as layers to the county parcel map.
- We instructed the crews to turn on the track logs in their devices. Office staff downloaded the track logs and were able to determine where crew had been and had NOT found knotweed—a “null survey”.
- We have tracked herbicide use in watersheds from year to year. In previous years, herbicide use has been used as a proxy for change in biomass to help measure treatment efficacy. Due to changes in treatment, this is no longer as directly comparable in many cases. This method of measuring effectiveness is only used when we have the necessary treatment details to make a comparison. Herbicide quantity and active ingredient, when available, is included in the section “Project Activities by Watershed”. Overall use will no longer be tracked in an appendix as in previous years.
- All survey and treatment data collected by Clallam County NWCB was added to a knotweed database. This database facilitates tracking of landowner contacts, agreement expiration, treatments, site status and monitoring. In 2014, treatment of additional invasive plants was included as a separate infestation record.
- We sent out a form to encourage uniform data collection (see Appendix II) and to meet the request of WSDA which issued re-defined reporting standards in 2014. There continues to be some reporting inconsistency by us and our partners which we will attempt to address in future forums and crew training.

Definitions-per WSDA protocol as of 2014, for all Clallam County NWCB records,

Examined acres-includes area searched and treated. Area was determined by the following formula: acres =length (of river corridor) in feet X width in feet of area searched /43560 (square feet in acre). Unless known to be otherwise, it was assumed that crews searched a minimum of a 50 foot corridor along the river.

Treated acres-includes the gross area where plants were actually treated; does not include area searched in which plants were not found. Acres were determined from the length X width as above-taken from GPS track logs, waypoints, and spray records.

Solid acres-based on the average calibration of individual back pack sprayers which in 2014 averaged around 40 gallons/acre, we assumed that each gallon of mixed product would treat approximately 1000 sq feet. (Gallons of solution used per treatment X 1000)/43560 was the formula we used to calculate this total.

Protected River Miles-was calculated by measuring the length of track logs in GIS.

5. Landowner Contacts and Agreement Management

- We determined rivers of concern where knotweed was known or suspected to occur and extracted corresponding landowner information from GIS layers.
- We solicited Landowner Agreements by phone, letter, face-to-face contact or email.
- We used the standard Landowner Permission forms produced by WSDA. CCNWCB staff explained to landowners that they could cancel the agreement at any time.
- We monitored expiration dates and solicited new agreements as needed.
- We monitored property ownership, and solicited new agreements when ownership changed.
- We contacted landowners before entering their property for survey or treatment.
- We entered all landowner data into a knotweed database. This included contact information, site information and date an agreement was signed.
- Staff acquired Landowner Agreements from January through October.

6. Permits

- CCNWCB and JCNWCB obtained NPDES permits from WSDA for water ways and multiple species of concern.
- Crews followed all posting and notification requirements as outlined in the permit.
- Total amounts of herbicide used by CCNWCB and JCNWCB crews were submitted on-line to WSDA at the end of the treatment season.

7. Treatment, Equipment, and Rate- NOTE: Additional herbicides, rates and methods used to control other invasive species besides knotweed are beyond the scope of this report.

Foliar—may be used on any site; other options for specific uses are listed below.

Equipment- low pressure, Solo Backpack Sprayers with a 4 gallon capacity

Application Rate-variable,

- Up to 1% of aquatic imazapyr solution, 1% surfactant, marker dye
 - Up to 6% solution of aquatic glyphosate, 1% surfactant, marker dye
 - Combination of up to 4% solution aquatic glyphosate and 1% imazapyr, 1% surfactant, marker dye
- Application method- Spray to wet.

Injection—uses may include small sites, during inclement weather or where knotweed is mixed with desirable species, or other sites where high selectivity is critical. Canes must be at least ½ in diameter.

(only the Mason County NWCB reported using this method on specialized sites for knotweed control in 2014)

Equipment-JK Injection Systems injection guns.

Application rate- Between 3 ml of a 100% solution of a glyphosate product per cane (no surfactants or dyes). Glyphosate formulations must be labeled for this method.

Application method- Knotweed canes exceeding ½ inch in diameter are injected with herbicide in a lower internode using a short injection needle. If pressure is encountered, an additional hole is punched near the top of the internode to allow air to escape as herbicide is put in. Treated canes are marked with paint to prevent retreatment.

Wipe—for small sprouts or highly selective treatments

(no crew reported using this method for knotweed control in 2014)

Equipment-foam paint brush. .

Rate -33% glyphosate solution with 10% surfactant, by volume, (or as allowed by label)

Application method Wipe herbicide onto the surface of leaves and stems. Or, cut each cane to height of three feet, wipe all sides of stem.

8. Records

- Crews filled out a WSDA approved Pesticide Application Record for each herbicide treatment. We retain original copies of Pesticide Application Records, as required by law.

OBSERVATIONS AND CONCLUSIONS

- Each entity seems to be satisfied with the effectiveness of their preferred rate of glyphosate/imazapyr/combo (shown in the protocols) that suit a mixture of goals which may be driven by grant timeframes or deliverables. The CCNWC continues to see good results from 1% imazapyr/1% Competitor which was used for all our treatments except where crews came upon knotweed when doing non-knotweed specific control work.
- Skipping treatments after several complete years seems to be working well in the rivers selected for this strategy—we have not found much movement from historically occurring sites. We continue to see declines in infestations, albeit smaller, when monitoring treatments that occurred after skipping a year. We are cautiously optimistic the spread of knotweed has been significantly arrested.
- To operate on a shoestring, we have taken advantage of an extensive body of landowner agreements built over the course of many years. As other entities' interest or funding ebbs and wanes, we find ourselves tasked with going back to these initial streams only to find many of our landowner permissions have expired. Strategizing a return cycle for older projects will necessitate another major investment in landowner contact. We will need to budget for this in future grant requests and timelines.
- Herbicide expended on re-treatments continues to decline. Because rates and formulations are changing as projects mature, herbicide usage from year to year is no longer a reliable proxy for treatment efficacy when comparing applications from year to year. In the past we associated less herbicide use with less knotweed biomass. In future, we should depend on dimension, density and habit information (as was previously collected with GPS data dictionaries), to document progress. We created a new form that captures this information. The form was approved for use by the WSDA. (See Appendix V)—It is still highly advisable to count stems and general height, to measure progress over time.
- WSDA's reporting request, to some extent represents a change in the data we have collected in the past. However, the changes come at a good time for most Peninsula projects; this standard works better at sites where plant height is smaller. We have used WSDA's request to re-energize standardization across jurisdictions. More entities responded to our reporting template than in the past, but there are still considerable inconsistencies that could be resolved through discussion and refined definitions.
- We used the new Hunt GPS maps compiled from a Missoula based company and purchased through Garmin for about \$100. These maps were an inexpensive and simple way to provide a lot of parcel information (such as outlines and ownership) to crews in the field. They weren't perfectly accurate, but often close enough. The maps include many Washington counties, although Jefferson is excluded.
- Track logs from the GPS units provide extremely valuable information about where crews went and where they missed. Downloads occurred both during and post season to analyze this information.
- We collected information about other invasives treated at the same time by PSC crews. This process was much improved this year over last which we attribute largely to an improved working relationship with PSC leaders. We need to spend more training time to ensure the proper information is collected to meet all needs.
- OKWG meetings are meant to encourage communication and cohesiveness among partners. Because the Olympic Peninsula is a relatively small place where partnerships can be constantly reconfigured, we need to ensure enough time and effort to maintain these vital relationships.
- More partners responded to the form we sent out, which helps standardize data for comparison
- We continue to incorporate Peninsula-wide knotweed activities into this report to show the level of effort and collaboration that has been generated to combat this threat to our natural resources and investments in human-made infrastructure. Crews increasingly reported re-invasion by other weeds as knotweed was controlled. Although much more difficult, we encourage an all-species approach, where feasible. Information about additional invasives treatment is being collected and gradually added to the OKWG report to show this effort and pragmatic shift. (See Table I)
- Jefferson County's policy regarding spot treatment of roadside noxious weeds continues to be contentious. It is critical to support the weed board's ability to treat knotweed with herbicides, especially along roadsides where simple management activities such as ditch cleaning and mowing spread fragments to areas that are much more difficult to treat and contain. In Clallam County we are pursuing an updated policy that allows limited herbicide use only for the control of noxious weeds and other invasive plants of special concern. Prevention and early intervention will always be the preferred strategy. Those become better options, now that we have greatly reduced overall knotweed infestations in both counties.
- The NPDES end-of-year online reporting was simplified, requiring only some specific species to be called out.
- The State's knotweed program continues to be indispensable. In addition to providing base funding, it has helped us provide permitting and technical advice to jump start other programs. The Olympic Knotweed Working Group continues to draw a diverse membership and MANY other groups now participate in knotweed control Peninsula wide. The Weed Boards are invested in supporting these groups and interested residents county wide. In many cases this WSDA funding is being used to leverage other grants. .

RECOMMENDATIONS

- Prioritize 2015 projects-In west Clallam County, the Sol Duc and associated tributaries are in the greatest need of inventory and project planning. It is unclear whether there has been comprehensive treatment between Quileute and ONP boundaries near La Push. Deep, Salt, and Nordstrom Creeks need additional permissioning and treatments, as do south Bagley Creek and East Fork Lees. It is likely that NOSC will need some additional assistance for knotweed control on the Dungeness. (It could be years before NOSC completes treatment of bad stretches of butterfly bush infested areas). We will need an influx of funding to cover planning and project preparations for these waterways.
- Increase pre-season communication with other project managers. Discuss reporting protocols. Look for more cross boundary project opportunities.
- Ensure that weed boards can afford to stay involved so that re-infestation, especially along waterways does not occur. As knotweed continues to decline, so does our confidence that landowners will be able or interested in doing appropriate detailed follow-up treatments.
- Perform Early Detection and Intervention where there is sufficient time.
- Continue to engage and encourage timber companies to increase their involvement in monitoring, prevention and treatment of terrestrial sites, especially rock sources. Seek contracting standards that take invasives issues into account.
- Increase outreach with hunters, fishers and other recreationists for knotweed detection.
- Update Best Management Practice documents. Consult with other knotweed control programs and WSDA before publication.
- Continue to incorporate information about other invasives in our working group meetings.
- Require training by Ecology for inexperienced WCC crews who are increasingly utilized for invasive control work. Focus on more training for crew leads. Funding for program managers who are expected to train, plan, and report for these crews, is needed!
- Continue efforts to effect a change in Clallam County Road Department policy to increase prevention activities, reduce the spread of noxious weeds by mowers, and to develop additional tools to control noxious weeds on roadsides. Support Jefferson County decision makers to ensure that there is maximum flexibility and that a broad array of tools continues to be available to prevent the spread of noxious weeds. Routine maintenance activities on roadsides are a major vector for knotweed spread.
- Continue updating the CCNWCB web page to include information highlighting work by partners, including contact information. Encourage partners to get work posted on more restoration sites-or incorporated into Lead Entity sites.
- Encourage planners to include weed inventory in pre-project check list.
- Provide a representative to watershed groups (such as lead entities) to ensure an invasive species management plan is incorporated into restoration proposals and to work towards grant schedules that allow for longer timelines for implementation.
- Further simplify NPDES reporting by requiring only total herbicide usage per watershed.

PARTICIPATING GROUPS

Clallam County Noxious Weed Control Board
Grays Harbor Noxious Weed Control Board
Jefferson County Noxious Weed Control Board
Mason County Noxious Weed Control Board
Mason Conservation District
King County Noxious Weed Control Board
Snohomish County Noxious Weed Control Board
Pierce Conservation District
US Forest Service
US Fish & Wildlife Service
USFWS National Marine Refuge
Olympic National Park
US Department of Agriculture
N. Cascades Exotic Plant Management Team/NPS
US Natural Resource Conservation Service
WA State Department of Natural Resources
WA State Department of Ecology
WA State Department of Transportation
WA State Department of Agriculture
WA State Department of Fish and Wildlife

Washington State University
Jamestown S'Klallam Tribe
The Lower Elwha Klallam Tribe
The Makah Nation
The Quileute Nation
The Quinault Indian Nation
10,000 Years Institute
Jefferson Land Trust
Hoh River Trust
North Olympic Land Trust
Hood Canal Coordinating Council
Hood Canal Salmon Enhancement Group
North Olympic Salmon Coalition
Pacific Coast Salmon Coalition
Forterra
Center For Natural Lands Management
East Jefferson WCC
Mason County WCC
Clallam and Mason PSC

See Appendix III for contact informatio

FUNDING

Projects summarized in this report were funded by: Washington State Department of Agriculture and Forest Health Protection (WSDA and NFS), the Washington State Department of Natural Resources-aquatic resource division, Clallam County Noxious Weed Control Board, the Salmon Recovery Funding Board (through North Olympic Salmon Coalition and Hood Canal Salmon Enhancement Group) and separate funding administered by the Quinault Indian Nation (through SRFB and EPA grants), 10,000 years Institute, the Quileute Nation, and Mason Conservation District.

PROJECT ACTIVITIES BY WATERSHED

CLALLAM COUNTY



Quillayute River System: Red lines indicate 2014 knotweed treatments on the Dickey and Bogachiel where the worst infestations remain. Sites worked on by the North Cascades EPMT with the National Park Service are not shown.

Quillayute River System

Crews—Quileute Natural Resources Crew (QNR), North Cascades Exotic Plant Management Team with the National Park Service (NCEPMT with NPS)

The Quillayute system includes the Sol Duc, Calawah, Bogachiel, Quillayute and Dickey, along with their tributaries. The entire Quillayute system is popular for fishing. The rivers host the healthiest stocks of wild winter steelhead in the Pacific Northwest, with as many as 19,000 fish returning in some years. These rivers also support large runs of Chinook and Coho salmon. There are no Threatened or Endangered species within the Quillayute watershed. The Quileute Tribe endeavors to preserve the ecosystem in its current, functioning state believing this to be easier and more cost-effective than restoring a system once it is degraded. Knotweed elimination is an important factor in preserving habitat for fish species. It is also important for elk and deer and other species that forage on the floodplain, where knotweed is out-competing native vegetation. Frank Geyer, Deputy Director/TFW Program Manager of Quileute Natural Resource Department has observed that elk and deer do not actively feed on knotweed and that elk have returned to calve on restoration areas previously infested with knotweed.

Dickey River

The Dickey is a large, low gradient river, draining 108 square miles, characterized by sandy bank soils and extensive off-channel fish habitat and riparian areas. The mainstem Dickey River flows for 8 miles from the confluence of the East and West Forks, joining the Quillayute River approximately one mile from the Quillayute's

mouth on the Pacific Ocean at La Push. Knotweed infestation levels in the Dickey before treatment began were possibly the worst on the Olympic Peninsula. The source was probably an old homestead approximately a quarter of a mile upstream of the East and West Fork confluence.

Knotweed treatment on the Dickey River began in 2002 and has been continued each year since. Work had been undertaken mainly by the Quileute Tribe’s Natural Resources division (QNR); the North Cascades Exotic Plant Management Team (The North Cascades EPMT) with the National Park Service has treated patches within Olympic National Park. Additionally, Lauren Urgensen, a University of Washington Graduate student studying knotweed impacts and control, established plots along the Dickey as part of her study from 2006 to 2008. In 2012 crews noted that tansy ragwort coming in after knotweed treatments is a big problem on this waterway. In 2013 7.5 miles—75 acres—were surveyed and treated on the Dickey River. Almost all the treated acreage on the Dickey is owned by Washington Department of Natural Resources (DNR) or Rayonier, a large timber company, making landowner permissions easy to obtain.

In 2014- QNR Crews examined 7.63 river miles, but the area treated was much reduced, and utilized about one third that of the previous year. The NCEMPT reported treating 0.65 acres for the Dickey/Quilayute Rivers.; it was not clearly defined if this meant solid acres by the definition used by the rest of the reporting groups.

| Herbicide use-Dickey River (gallons) | | | | | | | | |
|--------------------------------------|--------------|--------------|-----------|-------------|-----------|-------------|-------------|-------------|
| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Acres Treated | 140 | 50 | 95 | 101 | NA | 56 | 75 | 46 |
| Total Herbicide: | 12.65 | 0.165 | 18 | 7.21 | NA | 2.91 | 4.31 | 2.44 |

Calawah River

Both the North Fork and South Fork of the Calawah River originate in the Olympic National Park. They converge close to the town of Forks and the Calawah flows into the Bogachiel on the west side of Forks. The Calawah is 31 miles in length, with a drainage basin of 133 square miles.

In 2006 the Quileute Tribe surveyed the Calawah, recording 344 sites, all downstream from the North Fork-South Fork confluence. The Calawah was treated by the Quileutes each year from 2007 through 2013. Most of the knotweed on the Calawah is giant knotweed and has responded well to treatment. As with the Dickey, almost all land on the Calawah is owned by DNR or Rayonier.

In 2014, given the excellent response to previous treatment and tight funding, this river was not treated. (*For additional history of treatment in this areas, see previous reports*).

| Herbicide use-Calawah River (gallons) | | | | | | | | |
|---------------------------------------|--------------|-------------|-------------|-------------|-----------|-------------|-------------|------------|
| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Acres Treated | 202 | 100+ | 110 | 127 | NA | 65 | 64 | N/A |
| Total Herbicide: | 11.12 | 2.31 | 1.59 | 0.24 | NA | 0.15 | 0.18 | N/A |

Bogachiel River

The Bogachiel River joins with the Sol Duc, forming the Quillayute, about 4 miles from the town of La Push where the Quillayute empties into the Pacific Ocean. The Bogachiel is 46 miles in length, with a drainage basin of 154 square miles.

In 2006 the Quileute Tribe surveyed the Bogachiel, recording 1,336 sites. Knotweed infestation on the Bogachiel was so extensive it was not attempted immediately and attention was focused on the Dickey. Treatment began in 2008 and continued in 2009. Clallam County supplied a crew for 8 or 9 days, helping the Quileutes and supplying some grant match. In 2010 the remaining stretch was treated. In 2011 the entire river was re-treated. Knotweed populations were much reduced. In 2012 and 2013 the Quileute Tribe surveyed and retreated 13 river miles (131 acres) on the Bogachiel River. Herbicide use increased as more of the river was thoroughly treated.

In 2014 QNR surveyed and treated another 13 miles but in a greatly expanded area, thus increasing the overall amount of herbicide used. As with the Dickey, almost all land on the Calawah is owned by DNR or Rayonier.

| Herbicide use- Bogachiel River (gallons) | | | | | | | | |
|--|------|------|------|------|------|------|------|------|
| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Acres Treated | 4.1 | 900+ | 693 | 725 | NA | 131 | 131 | 343 |

| | | | | | | | | |
|-------------------------|-------------|--------------|--------------|-------------|-----------|-------------|-------------|-------------|
| Total Herbicide: | 0.65 | 33.88 | 77.34 | 62.1 | NA | 3.12 | 5.43 | 8.38 |
|-------------------------|-------------|--------------|--------------|-------------|-----------|-------------|-------------|-------------|

Quillayute River

Although the Quillayute has the largest drainage area on the Peninsula (629 square miles) the river itself is only 5 ½ miles long and approximately half its length is in the coastal strip of the Olympic National Park.

The Quileute Tribe treated knotweed on the Quillayute River in 2008 and 2009. Clallam County crews spent approximately 3 days in 2009 treating in and around a county park on the Quillayute. In 2010 The North Cascades EPMT with the National Park Service treated 0.94 acres of knotweed on the Quillayute, within the Olympic National Park. In 2011 the Quileutes treated the right bank of the Quillayute from the mouth of the Sol Duc River to the Olympic National Park; as well as the tribal property on the left bank and the North Cascades EPMT with the National Park Service treated knotweed within National Park boundaries. In 2013 the North Cascades EPMT with the National Park Service once again treated knotweed within National Park boundaries, on the Quillayute mainstem and at Lake Ozette (see map above), using approximately 0.12 gallons imazapyr and 0.2 gallons glyphosate.

Due to limited funding and resources, no treatments were reported on this river in **2014 except by the NCEPMT which combined the reported information with Dickey River totals. That figure was only reported once, in the Dickey River section.**

| Herbicide use-Quillayute River (gallons) | | | | | | | | |
|--|------------|-------------|------------|-------------|-----------|----------|-------------|----------|
| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Acres Treated | N/A | 170 | 40 | .5 | NA | 0 | 0.2 | 0 |
| Total Herbicide (gallons): | N/A | 6.77 | 1.7 | 0.64 | NA | 0 | 0.14 | 0 |

Sol Duc River and tributaries

The Sol Duc sub-basin, within the Quillayute watershed, drains over 200 square miles. The Sol Duc River originates within Olympic National Park and stretches for nearly 20 miles before emerging from Park boundaries. It then runs for 45 miles until it joins with the Bogachiel, forming the Quillayute. It contains timber lands, agriculture, and residential development. The Sol Duc supports numerous salmonids such as Chinook, Coho, chum, sockeye, and steelhead, as well as cutthroat and rainbow trout.

Upper Sol Duc

North Cascades Exotic Plant Management Team (NCEPMT) with the National Park Service has for several years treated a small patch of Himalayan knotweed (0.001 acres) in the upper part of the river. In 2013 they reported, for the first time, that no Himalayan knotweed was found within Olympic National Park boundaries.

In 2014 the NCEPMT reported treating 0.005 acres of Himalayan knotweed on the Sol Duc. (Soleduck is ONP's spelling)

Mid Sol Duc

In 2005, Clallam County Noxious Weed Control Board (CCNWCB) conducted a float survey on the mid section of the Sol Duc River (from the Park boundary to Whitcomb-Diimell boat launch on Highway 101). The Snider Work Center was the furthest upstream site found. Treatment began in 2006 and continued through 2010. No treatment was done on the Sol Duc in 2011. In 2012 the Quileutes surveyed and treated 26.6 river miles (155 acres) on the Sol Duc. 2.13 gallons of Aquaneat were used. In 2013 no knotweed was found at the Snider Work Center, and no treatments took place on the mid Sol Duc.

In 2014 knotweed minimal amounts of knotweed regrowth were treated by CCNWCB at the Snider Work Center.

Lake Creek and Lake Pleasant

In 2012 the CCNWCB performed a full survey and treatment was carried out on all parcels where permission had been received. Infestations were very light in most cases. On Lake Pleasant itself, Weed Board crew treated a very large terrestrial knotweed infestation for the first time and retreated some smaller areas. It was determined that this area would be a good candidate for skipping treatment in 2013.

In 2014 no treatment took place on Lake Creek or Lake Pleasant, but both will be considered for higher priority in 2015 if there is funding. *For additinal history of treatment in these areas, see previous reports.*

Lower Sol Duc

In 2006 the Quileute Tribe surveyed the lower section of the river (from Whitcomb-Diimell to the confluence with the Bogachiel). They recorded 447 sites. Almost half the sites had canes taller than six feet and some consisted of thousands of canes. More than half of the sites recorded in the lower Sol Duc were identified as giant knotweed, in contrast to the mid-section, which was virtually all Bohemian. The Quileute Natural Resource Crew and/or CCNWCB retreated as able from 2007 to 2010. No treatments occurred in 2011 and 2012. In 2013 the Quileutes surveyed and treated 51 river miles (155 acres) on the lower Sol Duc.

In **2014** no treatments occurred making this is a **high priority candidate** for treatments in **2015**.

| Herbicide Use, Lower Sol Duc River (gallons) | | | | | | | | |
|--|--------------|-------------|--------------|-------------|----------|----------|-------------|----------|
| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Acres Treated | 17 | 45 | 30 | 35 | 0 | 0 | 155 | 0 |
| Total Herbicide | 9.656 | 6.67 | 0.945 | 1.26 | 0 | 0 | 1.09 | 0 |

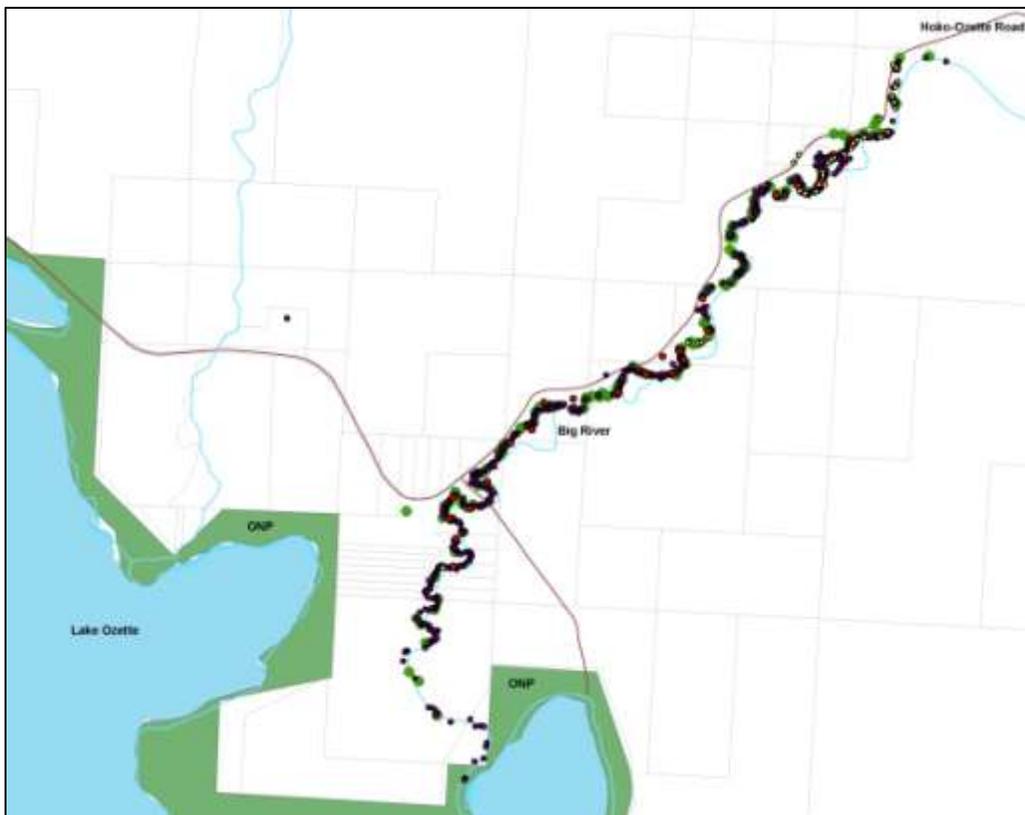
Forks

Knotweed has been observed in the city of Forks for several years and it is of concern because Forks is close to both the Calawah and the Bogachiel. One tributary to the Bogachiel passes through Forks and close to some of the knotweed sites. The Calawah and Bogachiel are major waterways in the Quillayute System. Both rivers have knotweed which the Quileute Tribe is trying to eradicate and there is fear of re-infestation if the Forks sites go unchecked.

Treatment began in 2006 and continued through 2009, done by CCNWCB and/or the QNR. No treatment took place in Forks in 2010 through 2012, although the Pacific Salmon Coalition, based in Forks, may have taken on some of these areas, but did not specifically report treatments. In 2013 the QNR crew treated 3 acres in Forks and Beaver, all privately owned. They used one gallon of AquaNeat. I

n **2014**, we think that the Pacific Salmon Coalition performed some treatment, but none were actually reported as of the writing of this summary. One site along Hwy 101 near the Sol Duc River was treated per landowner request.

For more information about the Quillayute River System, please contact Garrett Rasmussen at (360) 374-2027 or garrett.rasmussen@quileutenation.org



Big River: Purple indicates original 2006 knotweed treatments, red indicates 2009 treatments, yellow indicates 2011 treatments, and green indicates 2014 treatments.

Big River and Hoko-Ozette Road-

Crew—Clallam County Noxious Weed Control Board (CCNWCB), North Cascades Exotic Plant Management Team with the National Park Service (NCEPMT)

In 2011 CCNWCB treated only high-priority-sites. In 2012 the CCNWCB thoroughly surveyed and treated four miles of the Big River, upstream from the National Park boundary. This covered all of the historically heavily infested areas. Most of the knotweed consisted of individual stems or scattered clumps. Knotweed was still pervasive but the density was drastically reduced from past years. In 2013, NCEPMT treated within ONP boundaries at the mouth of the river where it empties into Swan Bay.

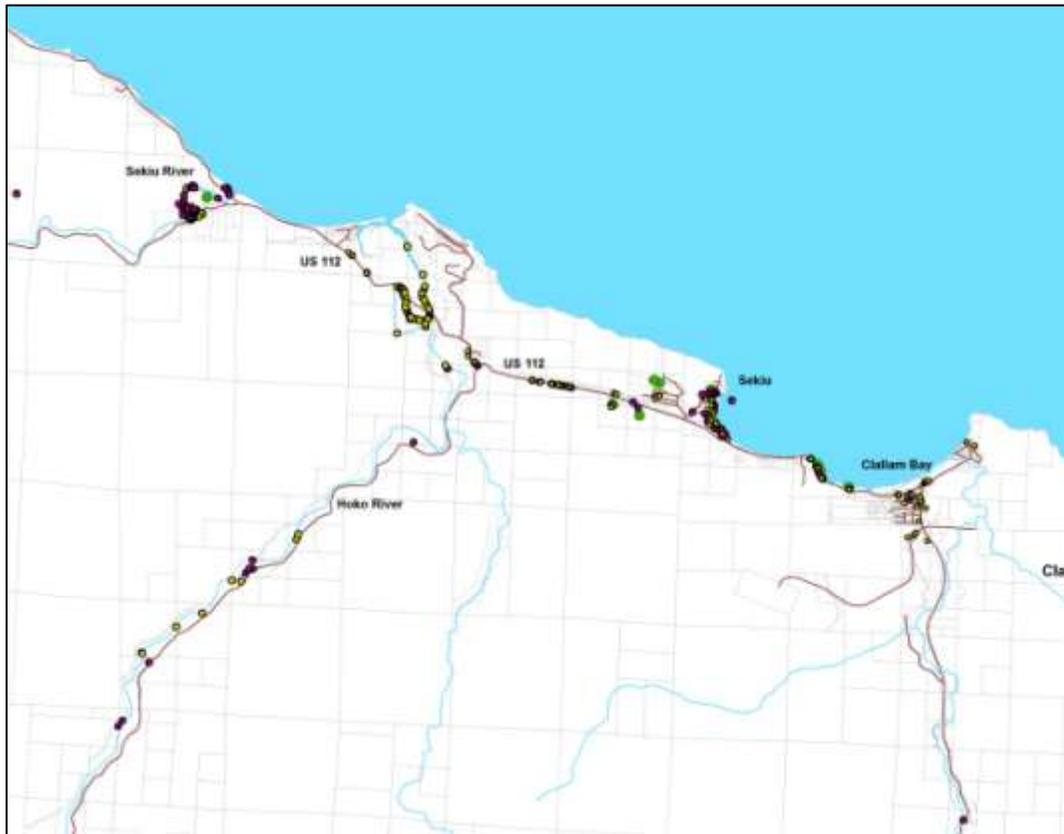
In 2014 CCNWCB treated the lower 4.6 miles of the river. Knotweed density has continued to decline; about half as much herbicide was used this year compared with 2012, the most recent year a fairly comprehensive treatment was conducted. Crew treated four private roadside sites along the Hoko-Ozette Rd. and a site by the Makah Fish Hatchery all of which were reported by the Makah Nation. NCEPMT reported treating minor infestations within ONP boundaries. *For a more detailed history of treatment in these areas, see previous reports.*

| Herbicide Use-Big River and Hoko-Ozette Road (gallons) | | | | | | | | | |
|--|--------------|-------------|--------------|-------------|--------------|--------------|-------------|------------|------------|
| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Inspected/Known Parcels | | | 30/42 (est) | 39/43 | 24/34 | 12/34 | 15/34 | 3/34 | 21/34 |
| Acres Treated | 60 | 28 | 57 | 57 | 22 | 10.4 | 25 | 3 | 10.01 |
| Aqua Neat or Glypro injected | 65.39 | 1.24 | 0 | 3.5 | 0.3 | 0.496 | 0.04 | | |
| AquaNeat or Glypro sprayed | | 3.3 | 1.876 | 1.3 | 2.28 | 0.12 | 0 | | |
| Habitat or Polaris (imazapyr) sprayed | 0 | 0.6 | 0.305 | 0.32 | 0.594 | 0.03 | 0.42 | .07 | .26 |
| Total Herbicide | 65.39 | 5.14 | 2.181 | 5.12 | 3.174 | 0.646 | 0.46 | .07 | .26 |

Hoko River

In 2012 crews surveyed and treated all known knotweed on the Hoko, including some sites on the upper Hoko that had not been surveyed or treated in more than three years because of difficult and remote access.

Because of the small amount of re-growth discovered in 2012, this river was skipped in both 2013 and **2014**. Because of difficult access in the lower reaches due to tidal influence, this river would be a good candidate for float surveys and we will endeavor to partner with the Makah Tribe or local landowners to make that a reality. *For additional history of treatment in this areas, see previous reports.*



Sekiu River, top left Hoko River, center towns of Sekiu and Clallam Bay, and Hwy 112, right: Purple indicates knotweed sites identified in original 2006 surveys/treatments. Yellow indicates 2012-13 treatments. Green indicates 2014 knotweed treatments. Little remains of the original infestations.

Sekiu River

Crew—CCNWCB

The Sekiu is a low gradient coastal river with many small forested, scrub-shrub and emergent wetlands scattered throughout. It flows into the Straits of Juan de Fuca about 10 miles east of the Makah Reservation. Much of the land in the watershed is zoned for commercial forestry. Chinook, Coho and chum salmon have been recorded in the Sekiu River, as well as winter steelhead and cutthroat.

Knotweed control on the Sekiu River began in 2006 and has continued each year since. Work has been performed by the Makah Tribe and/or Clallam County Noxious Weed Control Board. In 2010 control was made mandatory and one previously reluctant landowner then allowed us to treat rather than do it himself. In 2011 a small crew surveyed and re-treated on the Sekiu River, focusing on sites that had been treated just one or two

years, as opposed to 4 or 5 years. In 2012 a 4 person crew surveyed and treated all knotweed sites on the Sekiu River. Very few plants remained on most parcels. Two parcels that had belonged to a reluctant landowner were sold to a landowner who is very supportive of knotweed control efforts. We spent the majority of time treating extensive knotweed infestations on those two 5-acre parcels. The parcels are across the road from the river, but the largest portion of the infestation is in a swampy swale where the river backs up when it floods (reported by an adjacent land owner). In 2013 a two-person crew focused their attention on those two 5-acre parcels with heavy infestation, but incomplete treatment. Thousands of stems were still present, but herbicide use on those parcels decreased from 0.48 gallons (injected or sprayed) to 0.065 gallons (all sprayed). A couple of sites on the Sekiu River were not completed in 2013 because a crew injury made access difficult.

In 2014 a 2-man crew utilized a canoe to assess difficult to reach sites, while another 2-man crew tackled easily assessed terrestrial ones. In all cases, sites were greatly diminished. A new owner of one parcel where knotweed had been documented in the past, was reputedly interested in having crew treat, but did not respond to early letter requests because he feared we were charging for the service; the parcel was never accessible through a locked gate. We will try again next year.

In general this river is a good candidate for a skip year.

| Herbicide Use-Sekiu River (gallons) | | | | | | | | | |
|--|-------------|-------------|--------------|--------------|-------------|--------------|--------------|--------------|-------------|
| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| <i>Inspected/ Known Parcels</i> | N/A | | 1/11 | 10/11 | 10/11 | 10/11 | 10/11 | 9/13 | 13/14 |
| <i>Acres Treated</i> | N/A | 1.78 | 2 | 16 | 8.5 | 1.17 | 5.9 | 2.79 | 1.68 |
| <i>AquaNeat injected</i> | 0 | 0.1 | 1.7 | 0 | 2.125 | 0.25 | 0.25 | 0 | |
| <i>AquaNeat sprayed</i> | 0 | 0.18 | 0.06 | 0.487 | 0.18 | 0.18 | 0 | 0 | |
| <i>Habitat or Polaris (imazapyr) sprayed</i> | 0 | 0.02 | 0.007 | 0.122 | 0.045 | 0.045 | 0.276 | 0.125 | |
| Total Herbicide | 11 | 0.3 | 1.767 | 0.609 | 2.35 | 0.475 | 0.526 | 0.125 | .032 |

Highway 112, Clallam Bay and Sekiu Crew—CCNWCB

- Sekiu and Clallam Bay are small coastal towns about two miles apart, consisting mostly of fishing resorts and residential properties. Knotweed in the Sekiu and Clallam Bay area has a long history, dating back to 1930. Knotweed has long been associated with the coming of the railroad, although it is not clear whether it was planted intentionally or came as a contaminant.

- Highway 112 runs west-east near the shoreline and crosses the Sekiu, Hoko and Clallam Rivers. The Hoko-Ozette Road, which heads south-west from Highway 112, runs very close to both the Hoko River and the Big River. Both these roads serve as significant vectors of knotweed through movement of plant fragments in the course of road maintenance and related activities.

By 2004 there were large stands of knotweed in both Clallam Bay and Sekiu and along Highway 112. Many of the infestations were in or close to water (Straits of Juan de Fuca). CCNWCB treated knotweed in Clallam Bay and Sekiu and on the coastal bluff between the two towns each year from 2006 to 2012. These areas were skipped in 2013.

In 2014 we solicited a number of new permissions for sites including the Sekiu airport (per a Makah Tribe staff sighting) several private properties along 112 (per WSDOT sighting) and along the waterfront which is generally resort property. One resort manager asked that we delay treatment until tourists were gone for the season. One permission came back after the treatment season, but will be treated next year. In Clallam Bay, at the library, a small amount of knotweed, (10 stems), was dug. The library site, once massive, was successfully treated in previous years. Now it is consistently mowed, and plants were less than 1 inch tall. In general, treatments throughout this area have been tremendously successful. Little remains of the original infestations and very little herbicide was needed to check re-growth.

| Herbicide Use-Highway 112, Clallam Bay and Sekiu (gallons) | | | | | | | | | |
|--|-------------|-------------|--------------|--------------|------------|--------------|--------------|----------|-------------|
| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Parcels Inspected/Known Parcels | | | 55/67 (est) | 67/68 | 18/68 | 2/68 | 2/68 | 0/68 | 73/73 |
| Acres Treated | | 25 | 45 | 26 | 3.25 | 1.8 | 2 | 0 | 3.31 |
| Aqua Neat injected | | 3.5 | 1.945 | 0 | 0 | 0.16 | 0 | | |
| Aqua Neat sprayed | | 6.06 | 1.224 | 0.45 | 0.4 | 0.02 | 0 | | |
| Habitat or Polaris (imazapyr) sprayed | | 0.23 | 0.29 | 0.155 | 0.1 | 0.005 | 0.066 | | |
| Total Herbicide: | 17.9 | 9.79 | 3.459 | 0.605 | 0.5 | 0.185 | 0.066 | 0 | .074 |

Note: A site near the Sekiu airport and several along Hwy 112 were added this year. Much of the herbicide use is accounted for in those locations.

Clallam River Crew—CCNWCB

The Clallam is a low-gradient river, flowing into the Straits at the town of Clallam Bay. It is a unique system in that sand and gravel frequently block the mouth of the river. This phenomenon can cause flooding and can trap anadromous fish behind the gravel bar with no way to escape to the safety of the ocean, making them easy prey. In 1998 a channel was excavated to allow fish to escape. It was effective but was only a temporary solution. There is a popular County Park at the mouth, and also a large portion of land owned by Washington State Parks. The Clallam River is about 13.4 miles long. Coho and winter steelhead spawn in the mainstem, and in several tributaries. Moderate numbers (500 or less) of chum have been observed in the lower mainstem.

The first reported sightings of knotweed on the Clallam River were around 1998 and it has spread rapidly since then (Mike McHenry, Lower Elwha fish biologist, pers. com), although it is likely to have been present, but unnoticed, for much longer.

In 2006 the Makah Tribe surveyed the lower portion of the Clallam River and in 2007 funding from a NFWF grant with the Clallam Conservation District became available for the Lower Elwha Klallam Tribe to treat the knotweed there, with help from CCNWCB. Treatment has continued each year since. In 2010, knotweed control was made mandatory on the Clallam River, in hope of persuading reluctant landowners to allow us to treat. This was not as successful as it was on the Big, Hoko and Sekiu Rivers. There is still one parcel where the owners do not want us to treat, however, they are aware that they are responsible for treatments and that the CCNWCB will inspect for compliance. In 2011 and 2012 we attempted to re-treat all parcels on the Clallam River. For the most part knotweed infestations were drastically reduced along the length of the river. However, it was apparent that the family owning the property with the most upstream infestation had been cutting knotweed and throwing it in the river channel. We removed cut canes and advised the landowner of proper treatment methods. We also found a handful of dense patches that were located farther away from the river channel in the flood plain, or that were obscured by dense vegetation and had been missed in past years. In 2013 we made the Clallam River one of our priorities and a beefed-up crew searched the entire river corridor where knotweed has been known to occur. Herbicide use was reduced considerably yet again, by about 75%, between 2012 and 2013. We discovered and treated a tiny pioneer patch of yellow archangel; yellow archangel was seen nowhere else in the river corridor. This is a prime example of early detection and intervention, the most efficient noxious weed control strategy of all.

In 2014, the Clallam River was skipped because of low infestation levels encountered in 2013. *(For additional history of treatment in this area, see previous reports).*



Pysht River: Purple indicates knotweed sites identified in original 2006 surveys/treatments. Yellow indicates 2012-13 treatments. Green circles indicate 2014 knotweed treatments. Green triangles indicate other weed treatments.

Pysht River

Crew—CCNWCB-knotweed, Clallam PSC

The Pysht River is approximately 16.3 miles long and drains into the Straits of Juan de Fuca at Pillar Point, eight miles east of Clallam Bay. The Pysht supports Coho and chum salmon and winter steelhead. The Pysht River Estuary will be the subject of an extensive restoration project in partnership with the Lower Elwha Klallam, Merrill and Ring, Clallam County, North Olympic Salmon Coalition and other partners next year.

In 2005 knotweed on the Pysht was first observed and treated. No complete survey was taken that year, but two property owners notified CCNWCB of knotweed infestations. One of these owners was Merrill & Ring, which owns a large amount of land on the Pysht including a tree farm near the mouth. They were enthusiastic about controlling their knotweed and hired a crew to do the work, with help from CCNWCB. The other landowners who came forward were the Burdicks, who had a knotweed infestation covering 80,000 square feet. In 2005 they started manually digging knotweed as an alternative to herbicide use.

In 2006 Merrill and Ring hired a crew who treated their knotweed sites with help from CCNWCB. The crew noticed good results from the previous year's treatments. By 2006 only 50 to 100 canes remained; they were about 3 feet tall. Treatment continued each year through 2010. No treatment was done in 2011 on the Pysht because of reduced funding, but we did receive a renewed agreement to work with Merrill and Ring and their subsidiary companies through 2016. In 2012 Merrill and Ring staff conducted knotweed surveys, and a CCNWCB crew member treated those locations. Knotweed infestations on these parcels were reduced to a handful of clumps and scattered stems. In 2013 the Clallam PSC visited the Pysht River, treated other weeds, but did not find knotweed. A private contractor reported treating some small amounts of knotweed on terrestrial sites on behalf of the company.

In 2014 Merrill and Ring again requested treatment assistance from CCNWCB. M&R staff had already surveyed and identified sites for treatment. In total, only 185 small stems remained but a relatively new infestation of burdock was identified and treated by the CCNWCB at the same time. The only other landowner with knotweed continues to control their own manually. Merrill and Ring has been an exemplary steward working to combat knotweed on their far flung county-wide holdings!

A DNR funded Puget Sound Corps, treated 6 upstream acres held by the North Olympic Land Trust as part of additional restoration efforts taking place within the waterway. They treated a variety of species including reed Canarygrass, herb Robert, Canada thistle, and holly. Separately, the CCNWCB treated one of the only perennial sowthistle sites in Clallam County, at Pillar Point, within Pysht River estuary.



Deep Creek: Green indicates first knotweed treatment by CCNWCB, 2013

Deep Creek

Crew—Clallam PSC

Deep Creek drains 11,048 acres, and the elevation ranges from zero to 3,400 feet. It historically supported significant levels of Coho and chum production, with most of the chum salmon spawning in the lower three miles. Coho and winter steelhead spawners have been documented to RM 3.7 and 3.1 respectively. Fall Chinook used to spawn in Deep Creek but according to Mike McHenry, fisheries biologist for the Lower Elwha Klallam Tribe, they have been extirpated.

Because of the importance of Deep Creek to the Lower Elwha Klallam Tribe, and because there had been reports of knotweed infestations, CCNWCB sent the Clallam PSC crew to survey and treat in 2013. As discussed in previous sections, the Puget Sound Corps was able to treat other invasives, as well as knotweed, which we believe to be more effective than a single-species approach. They treated large amounts of Canada thistle, bull thistle and fox glove as well as knotweed. The herbicide usage on other species is not included in the following table. Because only two landowners were involved, landowner contact and getting permissions signed was easier than on many waterways.

In 2014, because we had limited days of PSC time, we did not retreat this waterway.

| Herbicide Use-Deep Creek (gallons) | | |
|---|--------------|-------------|
| | 2013 | 2014 |
| Acres Treated | 0.5 | 0 |
| Polaris (imazapyr) sprayed | 0.033 | 0 |
| Total Herbicide: | 0.033 | 0 |

Salt Creek

Crews—*Clallam PSC*

Salt Creek drains a basin of 44.6 square miles. The mainstem and its tributaries provide important Coho salmon spawning and rearing habitat downstream of a passable dam at RM 6.5. This same area used to support chum salmon, while Chinook salmon were limited to the reaches downstream of RM 3.5. Chum and Chinook salmon have not been documented in Salt Creek in recent years. Loss of large woody debris may be impacting habitat. In the Salt Creek estuary, about 15 acres of tidal marsh has been lost to a road that cuts across the estuary and disconnects the salt marsh from the tidal-influenced reaches of Salt Creek. This impacts juvenile rearing of all salmonids produced from Salt Creek.

Salt Creek has significance for the Lower Elwha Klallam Tribe, and CCNWCB had been aware for some time that knotweed might be present in Salt Creek and some of its tributaries. In 2013 we solicited landowner agreements from all landowners on Salt Creek and on Nordstrom Creek—one of the major tributaries. Nordstrom was selected because of reports of knotweed being seen there. Because Salt Creek and its tributaries are among the most heavily populated waterways in WRIA 19, over 100 landowners were involved, some having several parcels. Because we are in early stages of obtaining landowner permissions, we were only able to obtain 19 permissions, including some large landowners, such as the DNR and Green Crow. However, this left a checkerboard pattern typical of early stages of a project. Crew treated knotweed on just one parcel, using 0.015 gallons of imazapyr.

In 2014, because we had limited days of PSC time, we did not retreat this waterway.

| Herbicide Use,-Salt Creek | | |
|----------------------------------|--------------|-------------|
| | 2013 | 2014 |
| Acres Treated | 1 | 0 |
| Polaris (imazapyr) sprayed | 0.015 | 0 |
| Total Herbicide: | 0.015 | 0 |

Elwha River

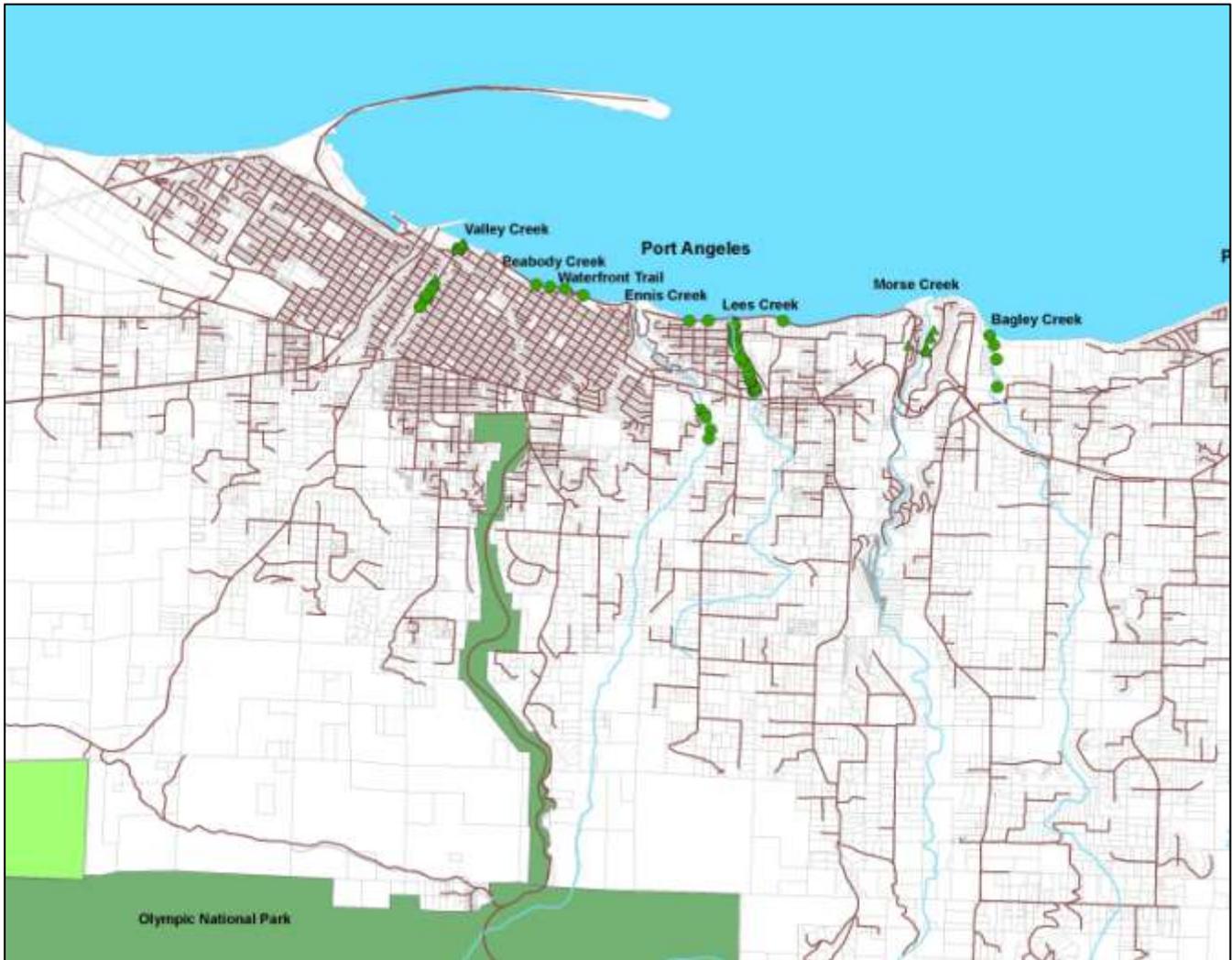
Crews—*Lower Elwha Klallam Tribe, WCC, NCEPMT with NPS*

The Elwha is a river in transition. Two dams were removed in 2012, and the former reservoir lake-beds and river ecology are subject to intense research and restoration efforts.

In 2012 and 2013 Lower Elwha Tribal crews, a Washington Conservation Corps, and North Cascades EPMT crew conducted noxious weed treatments throughout the season. Knotweed infestations of the Elwha have been very light in the last few years.

We do not have **2014** information specific to knotweed and other invasives activities from these crews but there has been extensive work conducted in areas above both dams which have now been fully removed.

For more information contact Mike McHenry, Lower Elwha Tribe Fisheries Biologist Mike.McHenry@elwha.nsn.us or Josh Chenoweth Olympic National Park Restoration Botanist joshua_chenoweth@nps.gov



Port Angeles area streams: Green circles indicate 2014 knotweed treatments. Green triangles indicate other weed treatments. Treatments by the North Cascades EPMT with the National Park Service are not shown.

Port Angeles Area Streams

Crews—CCNWCB, Clallam PSC, and the North Cascades EPMT with the National Park Service

Valley Creek

Crews— Clallam PSC

Valley Creek is a small stream which empties into the Port Angeles Harbor. Salmon and steelhead have probably been extinct from the creek since the late 1940's, when the final sections of the approximately 2,000-foot culvert at the mouth were installed. Recent surveys of fish in this system revealed numerous resident cutthroat trout up to 11 inches in length. The section of the creek by Valley Street has been severely infested with knotweed for decades and treatment has been ongoing for several years, up until 2010. No treatment took place in 2011 (due to bridge construction blockages). In 2012 we conducted a survey with a Streamkeeper team, where very minor or small epinastic growth was documented. In 2013 full treatments were planned through the use of a Puget Sound Corps, but did not take place due to crew attrition by early September. Instead, only one site where a small amount of re-growth was seen, was treated. At the same time, the only known purple loosestrife site in and around Port Angeles was treated (total of 15 plants) before it could become a major problem.

In **2014** the Clallam PSC surveyed and treated 1.4 miles (11 parcels) of Valley Creek for multiple invasive species including purple loosestrife, teasel, herb Robert and others. Knotweed was their top priority. We attempted to obtain permission from two landowners on adjacent properties with a clump of knotweed on each, but were never able to get them to respond to letters or in-person communication. We will try again next year.

Peabody Creek

Crews— *CCNWCB*

Peabody Creek is a small urban stream, draining a watershed of 2.6 square miles, with its headwaters in the northern part of the Olympic National Park. Some logging has occurred in the upper watershed but good stands of mature timber still remain. The 4.8 mile long stream flows through heavily urbanized areas of Port Angeles. Sewage was historically discharged directly into Peabody Creek and large quantities of stormwater are still directed into it. Coho and possibly chum salmon were observed historically but are thought to be extirpated. Currently only cutthroat trout are known to utilize Peabody Creek. In 2009 we received permission to treat from 4 landowners whose property covered about ½ mile of the creek, within the City of Port Angeles. In 2010 these sites were re-treated and we surveyed further upstream, finding large stands of knotweed. In 2011 no treatment took place because funding uncertainties made advance planning difficult. Additionally, this creek which is severely degraded, was not a high priority for restoration for a variety of reasons. In 2013, renewed interest in this creek led its inclusion as a site for citizen-science and volunteer restoration efforts. We treated small amounts of knotweed re-growth within in the first ½ mile of the river where we able to renew permissions.

In **2014**, due to limited resources, only one site, owned by the city of Port Angeles, which had been heavily infested and highly disturbed by piping, was treated. Depending on interest among restoration groups, this stream may be re-visited next year.

Ennis Creek

Crews— *CCNWCB, NCEPMT*

Because the headwaters of Ennis Creek are at 6000', in the Olympic National Park, it is significantly affected by both snowmelt and runoff. This type of system typically has the highest stock diversity of anadromous fish. Historically Ennis Creek supported stocks of Coho, steelhead, and chum. Currently Coho stocks are highly degraded. Steelhead and cutthroat numbers are higher. The lower reaches of Ennis Creek flow through urban areas of Port Angeles where water quality is impacted by stormwater runoff. An old Rayonier mill site is at the mouth of Ennis Creek and this portion of the creek has been rocked, channelized and the riparian corridor highly degraded. The old mill site has had a significant knotweed infestation for many years.

Knotweed treatment has taken place on Ennis Creek and the nearby Waterfront Trail from 2007 through 2010, implemented by the CCNWCB and/or the North Cascades EPMT with the National Park Service. In 2011 The North Cascades EPMT with the National Park Service treated within their jurisdiction near Lake Dawn, but the lower reaches were not treated. In 2012 an almost complete treatment was carried out in the lower part of Ennis Creek. In 2013 most known sites were re-treated, excepting the old Rayonier mill site (because of company concerns about ongoing litigation over historic pollution clean-up). The North Cascades EPMT with the National Park Service treated knotweed on Ennis Creek, near Lake Dawn, within Olympic National Park. 0.233 gallons of herbicide were used.

In **2014**, CCNWCB crew only managed to treat the lower portion of the creek between US 101 and Golfcourse Rd, approximately 2/3 of a mile, where re-growth continued to be light. We did not have sufficient resources to complete more upstream surveys. The NCEPMT reported treating 0.001 acres of knotweed upstream within ONP boundaries this year. The upper reaches and mouth are good candidates for treatment in 2015.

Lees Creek

Crews— *CCNWCB, Clallam PSC*

Lees Creek is a medium-sized stream, entering the Strait of Juan de Fuca just east of Port Angeles. It currently supports very low numbers of anadromous salmon, limited to a few returning Coho and steelhead. It is a "naturally closed channel" through the summer, as the mouth of the channel is isolated from the Strait of Juan de Fuca by a natural sand spit during low flow periods. Lees Creek has been significantly altered from its historic

condition. Fish passage is constricted, large woody debris is lacking and stormwater negatively impacts water quality. No active restoration or improvement actions are known in the Lees Creek watershed. Surveys in 2011 found only a small amount of knotweed on Lees Creek (the East Fork of Lees Creek was not surveyed), and treatment occurred in June. One half gallon of Aqua Neat was sprayed or injected on the Lees Creek during 2011. No treatment or surveys took place in 2012. In 2013 we received a significant number of new landowner permissions for both Lees Creek and the East Fork of Lees Creek, which had never been surveyed. Six sites on Lees Creek and 3 sites on the East Fork were treated, using a total of 0.2 gallons of herbicide (imazapyr). Yellow archangel was also treated on the East Fork—another important opportunity to eradicate an infestation before it has spread.

In **2014**, several new permissions were obtained, but in general, re-growth was light. Unfortunately, crew ran out of time and did not complete surveys of East Fork Lees Creek, a good candidate for 2015.

Morse Creek and Waterfront Trail

Crews— CCNWCB

While no knotweed has been found directly on Morse Creek itself, several patches of knotweed have been found in adjacent areas along the Port Angeles section of the Olympic Discovery Trail-a.k.a. the Waterfront Trail. Crew surveyed four shoreline miles of this trail and treated 8 infestations for about a total of 300 stems, some tumbling from high bluff above the trail. An infestation of yellow archangel here and along Morse Creek itself were also treated. Yellow archangel is a high priority in Clallam County because of its very limited distribution to date.

Bagley Creek

Crews— CCNWCB

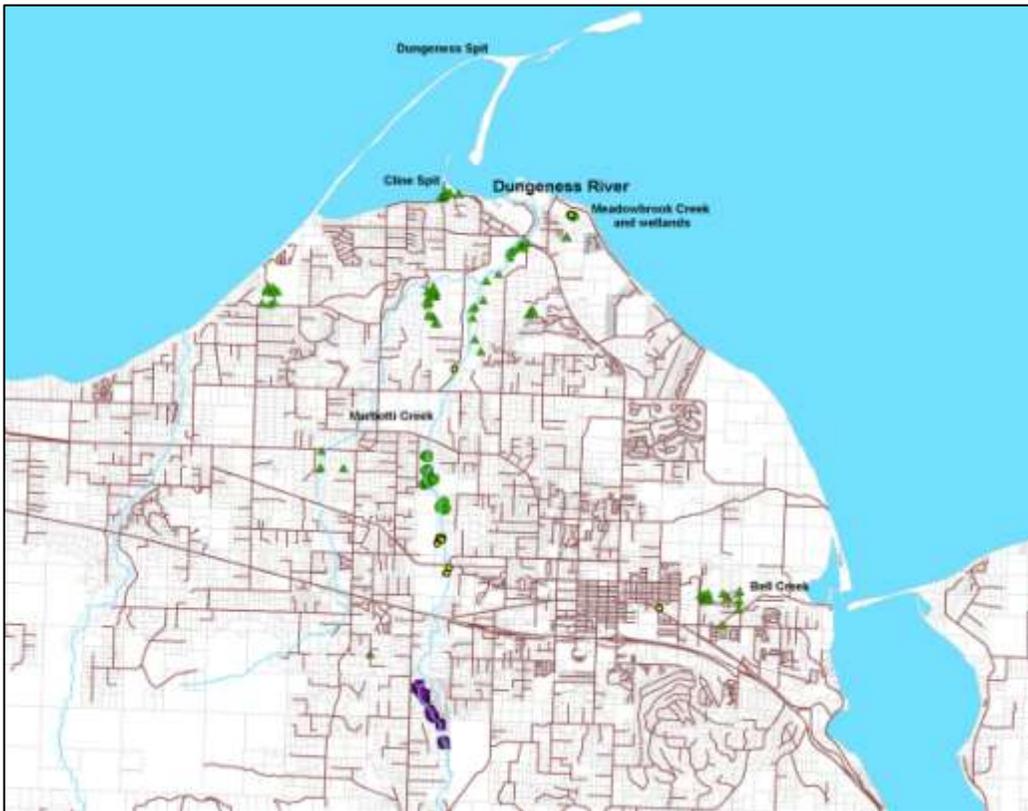
Bagley Creek is a medium-sized independent drainage, entering the Strait of Juan de Fuca approximately 2 miles west of Green Point. Coho and fall chum salmon and winter steelhead are the only identified anadromous fish known to exist in Bagley Creek. The watershed has experienced widespread timber harvest and conversion to residential use.

Knotweed had been observed previously near the mouth, but surveys and treatment did not occur in the creek until 2011. In 2011 a survey and two treatments were completed along the lower 3/4 mile of the creek, and a partial survey was completed further upstream. Slightly less than a gallon of AquaNeat was sprayed or injected on Bagley Creek during these treatments. In 2012 crews identified the source of the knotweed infestation on Bagley Creek about 1/4 mile south of highway 101. Permission was obtained from all but two landowners in the source area, and treatments were carried out in those locations. In 2013 a PSC crew re-treated knotweed on the lower 3/4 mile. One other site, north of the highway was also treated but the source area, south of the highway, was not. The crew took a point marking a site where Bagley Creek crosses Bagley Creek Road, but they did not treat it. Very small amounts of herbicide were used—0.015 gallons of imazapyr and 0.023 gallons of glyphosate.

In 2014, because of the uncertainty of work completed in 2013, crew retreated north of US 101. However, due to crew time constraints, Bagley Creek south of US 101 was not revisited. This will be a good candidate for treatments in 2015.

| Herbicide use Port Angeles Area (gallons) | | |
|---|--------------|---------------|
| Waterway | 2013 | 2014 |
| Valley Creek | 0.015 | 0.010 |
| Peabody Creek | 0.056 | 0.050 |
| Ennis Creek | 0.075 | 0.010 |
| Lees Creek | 0.0010 | 0.220 |
| East Fork Lees Creek | 0.001 | 0.000 |
| Morse and Waterfront | N/A | 0.070 |
| Bagley Creek | 0.038 | 0.0013 |
| Total | 0.186 | 0.3613 |

The increase in overall herbicide totals can be attributed to new sites treated in Lees Creek, all other decreased. Note: Herbicide use for other noxious weeds is not included in this total.



Dungeness River and associated creeks: Yellow circles indicate knotweed treatments in 2013. For 2014, green circles indicate knotweed, purple squares indicate butterfly bush, green triangles indicate other invasives in high priority treatment sites, respectively.

Dungeness River and surrounding area

Crews—*East Jefferson WCC-under North Olympic Salmon Coalition and Jamestown S’Klallam Tribe, Clallam PSC*

The Dungeness River, which is in the eastern portion of WRIA 18, drains 198 square miles. The mainstem extends 31.9 miles and its primary tributary, the Gray Wolf River, adds another 17.4 miles. There are an additional 256 miles of tributaries in the basin. Historically, the Dungeness was highly productive and diverse containing 11 individual salmonid populations. The Dungeness has experienced significant decreases in stock productivity levels and has been the subject of extensive habitat restoration and conservation for many years. In many cases, the Jamestown S’Klallam Tribe, in partnership with other local agencies has been instrumental in implementing restoration efforts. The Tribe treated knotweed on the Dungeness from 2004 through 2008. From 2009 to 2012 they did not survey or treat for knotweed. They focused their attention on other invasives, particularly butterfly bush.

In 2013 the Clallam PSC crew treated knotweed at 2 different Clallam County parks on the Dungeness—Mary Lukes Wheeler and The Railroad Bridge Park. Several other species were treated at Mary Lukes Wheeler, and at the Railroad Bridge Park large amounts of butterfly bush were treated by the cut-stump method. About 100 knotweed canes were found at Mary Lukes Wheeler and 52 at Railroad Bridge. Herbicide amount had to be extrapolated based on these figures and we estimate about 0.1 gallons of glyphosate was used in total on knotweed. This crew also treated a WDFW site in a critical wetland area near Three Crabs Road, close to Meadowbrook Creek, where knotweed has been present for some time. Other species—Canada thistle, Scotch broom, blackberry, poison hemlock and teasel—were also treated. Although the crew was specifically instructed to use imazapyr or glyphosate, it appears that was not the case. Approximately 0.02 gallons of triclopyr were used (as estimated from their spray record.)

In **2014**, NOSC, through highly successful landowner outreach, had continued butterfly bush treatments upstream. Unfortunately, all DNR funded crews were pulled mid-season for fire in eastern Washington and NOSC requested additional assistance from the Clallam PSC to treat knotweed identified on parcels downstream. Because of limited crew time, we were only able to offer an additional day. During this time they treated

knotweed spanning 7 acres on 11 parcels. This crew treated other noxious weeds on an additional 33.5 acres downstream near the mouth of the river. Knotweed has been seen in this location in the past, but was not found there this year. Other species were treated-including those mentioned about. The PSC also returned to the high value habitat area surrounding Meadowbrook Creek treating small amounts of knotweed within 1 acre there, as well as other noxious weeds encompassing an additional 8.25 acres.

Bell Creek

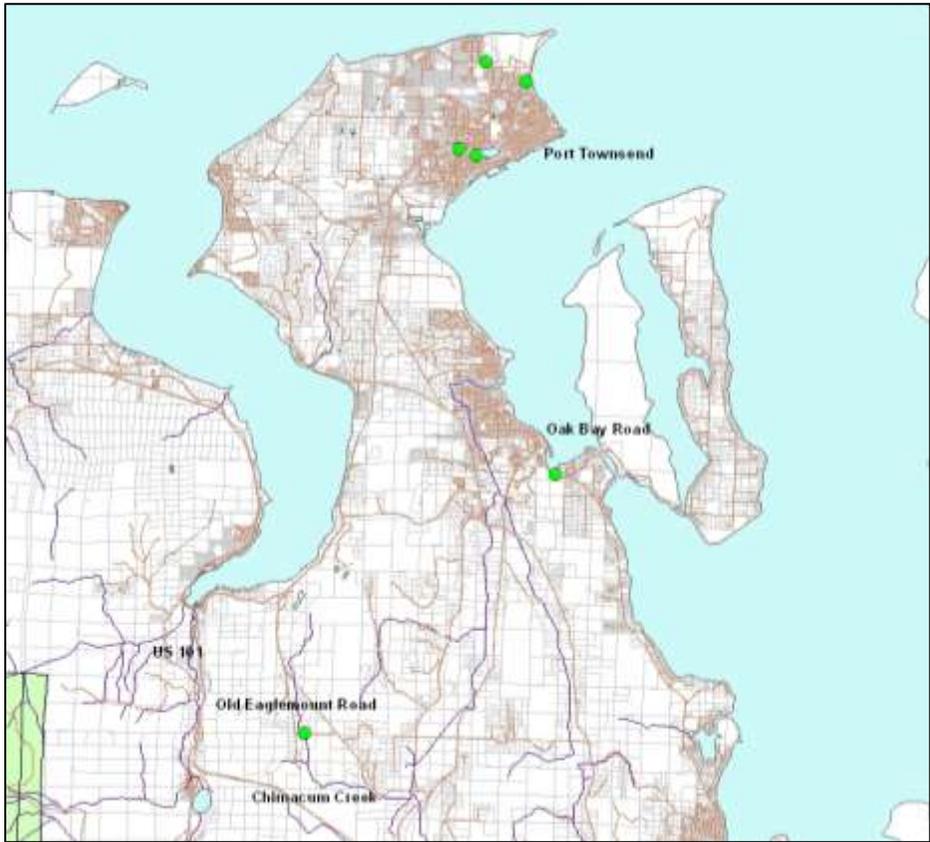
Bell Creek is approximately 3.8 miles long and drains 8.9 miles of low elevation watershed. It flows from Happy Valley, through the eastern portion of Sequim, into Washington Harbor at the entrance to Sequim Bay. It has been heavily influenced by irrigation runoff since the initiation of irrigation in the Sequim-Dungeness Valley. We had been aware for some time of a patch of knotweed on an industrial site on Bell Creek in Sequim and in **2013** the PSC treated it, using 0.02 gallons of glyphosate.

In **2014**, although monitored, no knotweed was seen on this site. The Clallam PSC performed additional invasive control work downstream of this site which has not been included in this report.

| Herbicide Use,-Dungeness River and Surrounding Area | | |
|--|-------------|-------------|
| | 2013 | 2014 |
| Acres Treated | 0.5 | 8.0 |
| Herbicide | 0.12 | .425 |
| Total Herbicide: | 0.14 | .425 |

For more information about control efforts on the Dungeness River, please contact Hilton Turnbull at (360) 681-4603, hturnbull@jamestowntribe.org. or Sarah Doyle at (360) 379-8051, sdoyle@nosc.org

PROJECT ACTIVITIES BY WATERSHED—CONTINUED
EAST JEFFERSON COUNTY



Port Townsend area: Bright green indicates 2013 knotweed treatments by CCNWCB and JCNWCB—no treatments took place at these locations in 2014.

Port Townsend Area:

In 2014 None of these areas were treated due to staffing shortages at the Jefferson County Noxious Weed Control Board. For additional history of treatment in this areas, see previous reports.

- **Kah Tai Lagoon Park** in Port Townsend. A highly visible knotweed infestation of approximately 0.75 acres had been present at an entrance to the park for many years. Its location adjacent to the lagoon makes it likely that winter flood events could move plant parts off site. This site was treated each year from 2008 through 2011. This patch of about 20 remaining canes was re-treated in 2013, along with three other small sites in Port Townsend.
- **Old Eaglemount Road** runs close to Chimacum Creek, a stream which is home to federally listed Hood Canal summer-run chum. The tidelands at the mouth of Chimacum Creek are popular for clam-digging. A small stand of knotweed on Old Eaglemount was treated in 2010 and 2011. Very little is left. It was re-treated in **2013**—only 4-5 small stems remained.
- **Oak Bay** near Port Hadlock, off of Admiralty Inlet, is a popular shellfish-harvest area, well known for geoduck. Weed board staff had observed a stand of knotweed close to the water and treated it with permission from the landowner 2011. This site of about 40 remaining canes was re-treated in 2013. Knotweed populations were much reduced, but teasel has taken over.

| <i>Herbicide Use, Port Townsend Area (gallons)</i> | | | | |
|--|--------------|----------|---------------|----------|
| | 2011 | 2012 | 2013 | 2014 |
| <i>Port Townsend (several sites)</i> | 0.15 | 0 | 0.014 | 0 |
| <i>Old Eaglemount Road</i> | 0.004 | 0 | 0.0008 | 0 |
| <i>Oak Bay</i> | 1.125 | 0 | 0.01 | 0 |
| Total | 1.279 | 0 | 0.0248 | 0 |



Quilcene area: Dark green circles indicate knotweed treatment by CCNWC, green triangles indicate other treatment of other noxious weeds. Light green circles indicate knotweed treatment by East Jefferson WCC-for HCSEG.

Quilcene Area:

Crew—East Jefferson WCC(EJWCC), CCNWCB

Big Quilcene River

The Big Quilcene River drains a basin of approximately 70 square miles, most of which is under federal ownership. The Big Quilcene mainstem is 19 miles long, with its headwaters located at a high elevation in the Olympic National Forest. The upper reaches of the Big Quilcene River are high gradient, highly confined channels. The City of Port Townsend has a diversion dam at River Mile 9; most of the water used in Port Townsend comes from the Big Quilcene. The middle reaches between River Mile 5 and RM 2.5 are moderate gradient channels with widened floodplains. There is Federal Fish Hatchery at River Mile 3. Low gradient, unconfined channels characterize the lower 2.5 miles, while the lower mile meanders across a broad alluvial fan. The lower reaches of the Big Quilcene are a popular fishing area, the main species being chum and Coho. Large stands of giant knotweed have been visible for many years on the alluvial floodplain at the mouth—one local resident remembers playing in the knotweed 40 years ago!

In 2008 JCNWCB and the Hood Canal Coordinating Council surveyed the river to determine how far upstream the infestation went. The furthest upstream knotweed found on the Big Quilcene mainstem was a little upstream from the Fish Hatchery. Dense populations were found half a mile downstream from the Hatchery and they continued intermittently to the mouth. Knotweed on the Big Quilcene was treated by a Clallam County crew in 2008 and 2009. In 2010 the East Jefferson WCC crew, jointly funded by North Olympic Salmon Coalition, Hood Canal Coordinating Council and the Hood Canal Salmon Enhancement Group (HCSEG), spent 19 days treating

knotweed on the Big Quilcene. Good progress was made. In 2011 the WCC crew re-treated all sites on the Big Quilcene. JCNWCB assisted with landowner contacts. In addition to treatment, landowners were given the option of having native plants installed on their property. In 2012, knotweed was retreated in all known sites with the assistance from East Jefferson WCC crew, HCSEG volunteers and HCSEG Americorps members. The East Jefferson WCC crew, funded by HCSEG did all Big Quilcene treatments in 2013 and 2014. HCSEG's report states that "in 2013 all previously treated knotweed sites were treated, including some new parcels. Knotweed re-growth is not evident in the upper reaches of the river near Hwy 101, but remains consistent in the mid and lower reaches. The Big Quilcene River has a combination of all three types of knotweed including giant knotweed. A few properties showed resilience to previous years' herbicide treatments. It was noted that seeds were found on some plants on this river, which may explain the lack of response to previous treatment."

In **2014** the East Jefferson WCC reported that no knotweed was evident in the upper and middle reaches of the river, treatments focused on the lower reaches. HCSEG offered native re-vegetation to a few property owners in the upper and middle reaches of the river in 2014. Outreach for further native plantings will continue in 2015.

| Herbicide Use-Big Quilcene River (gallons) | | | | | | | |
|---|-------------|---------------|--------------|-------------|-------------|----------------|---------------|
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Acres Treated | 13 | 55.75 | 42.75 | 4.06 | NA | 5 (est) | 6(est) |
| AquaNeat injected : | 2.06 | 0 | 0 | 0 | 0 | 0 | |
| AquaNeat sprayed | 3.6 | 18.291 | 31.43 | 9.77 | 7.33 | 9.92 | 4.339 |
| Polaris AQ sprayed | 0 | 0 | 0.94 | 0 | 0 | 0 | |
| Total Herbicide | 5.66 | 18.291 | 24.1 | 9.77 | 7.33 | 9.92 | 4.339 |

"Acres Treated" were calculated simply by adding together the acreage on all of the Pesticide Application Records and may vary depending on whether the applicator recorded strictly the area treated or the whole infested area. The discrepancy between acres treated in different years may be due to different counting methods being used. In 2011 the crew recorded strictly the acreage covered by knotweed, not the total infested area, as they had done in previous years. This accounts for the greatly reduced acreage. Data on acres actually treated was not supplied in 2013 and 2014.

Town of Quilcene

The Jefferson PSC crew re-treated a site where a private landowner had been battling knotweed on her farm for years. The Jefferson PSC and the Weed Boards worked on several small sites along East Quilcene Road, which runs alongside the Little Quilcene River and Quilcene Bay. Most significantly, the Jefferson PSC began treating a medium stand of knotweed at the Herb Beck Marina in Quilcene. Dealing with this will be a multi-year project.

In **2014**, CCNWCB crew treated knotweed at small sites in and around Quilcene. However, there were insufficient resources to treat at Lake Leland and Tarboo Creek this year.

Lake Leland

The Lake Leland County Park is a popular fishing destination. Four distinct knotweed patches have been observed around the south end of the lake divided between County road right-of-way and private property. Permission was obtained from private landowners, and all sites were treated or re-treated in 2011. No treatment took place in 2012. In 2013 the Jeffers PSC treated large amounts of reed canarygrass on Lake Leland and Leland Creek. We hope, but lack proper documentation, that they treated knotweed there as well.

In **2014** JCNWCB did no treatments due to a staffing shortage.

Tarboo Creek

Tarboo Creek, which drains into Dabob Bay, is a small but significant stream. 2,700 acres near its mouth are now protected by many different groups and agencies including Jefferson Land Trust, WDNR and the Northwest Watershed Institute (NWI). The lower portion of Tarboo Creek is virtually undeveloped and it includes both conifer and deciduous forests and supports protected species such as bald eagle, northern spotted owl and marbled murrelet. Knotweed was treated in 2011, 2012, and 2013 in a joint effort between JCNWCB and NWI.

In 2014 JCNWCB did no treatments due to a staffing shortage.

Little Quilcene River

The Little Quilcene River drains a basin of approximately 40 square miles. Its headwaters originate above 4,400 feet on the north slopes of Mount Townsend and its runoff is derived from both rainfall and snowmelt. The upper watershed is within the Olympic National Forest and is steeply dissected with high gradient, confined stream channels. The lower valley and the flood plain have been developed for domestic and agricultural use and timber harvest. The lower 0.8 miles have been diked and the banks armored to protect property in the floodplain. The Little Quilcene River discharges to Quilcene Bay approximately one mile north of the mouth of the Big Quilcene. The estuary supports populations of Chinook, pink, chum, steelhead, Coho, sturgeon and cutthroat. However, the dike system, put in place nearly 100 years ago, has disturbed tidal function in the estuary. Sediment washed downstream has caused the formation of a "delta cone"—a build-up of sediment in the estuary that can bury the salt marsh—important to young salmon because it offers food and protection from predators. The Hood Canal Salmon Enhancement Group (HCSEG) owns land near the mouth of the Little Quilcene and has mounted a large restoration effort in the estuary. 35,000 cubic yards of soil have been removed and the shoreline has been moved back 400 feet. In 2009 HCSEG noticed knotweed growing near the mouth and asked JCNWCB for help in removing it. In 2010 the East Jefferson WCC crew sprayed the remaining knotweed near the mouth of the Little Quilcene River. Only a small amount remained.

In 2013 and 2014 the East Jefferson WCC crew treated a couple of small patches near the mouth of the Little Quilcene River. CCNWCB also treated one small patch upstream.

| Herbicide Use, Quilcene Area (gallons) | | | | |
|---|-------------|-------------|--------------|---------------|
| Waterway | 2011 | 2012 | 2013 | 2014 |
| Quilcene Town | 0.56 | 0 | 0.325 | 0.003 |
| Tarboo Creek | 1.96 | 2.25 | 0.03 | 0.00 |
| Herb Beck Marina--Quilcene | 0 | 0 | 0.34 | 0.05 |
| Little Quilcene River | N/A | N/A | 0.09 | 0.017 |
| Total | 2.52 | 2.25 | 0.782 | 0.0700 |

Note that 2011 and 2012 treatments were solely glyphosate. In 2013 the Weed Boards used imazapyr at 1%. There was a 90% in overall use between 2013 and 2014, when imazapyr was again used.



Dosewallips/Duckabush: Dark green circles indicate 2014 knotweed treatment by CCNWCB and/or Clallam PSC. Green triangles indicate other noxious weed treatment by CCNWCB . Bright green circles—East Jefferson WCC. Yellow diamonds show knotweed sites found on the Dosewallips by CCNWCB and/or PSC in 2013.

Dosewallips/Duckabush and vicinity

Crews—CCNWCB, Clallam PSC, and the East Jefferson WCC

Spencer Creek

Spencer Creek is a comparatively short waterway that flows into Jackson Cove in the northwest section of the Hood Canal. We have treated a severe infestation upstream on Spencer Creek since 2008. In 2011 a large infestation was discovered at the mouth and was treated. When treating we also found and treated a large infestation of giant hogweed, a class A noxious weed. In 2012 we retreated the upstream site and discovered more large stands of knotweed downstream that had never been treated. We received permission from all affected parcels but one. The CCNWCB and JCNWCB treated all permissioned sites. We also re-treated both the knotweed and the giant hogweed at the mouth of Spencer Creek. Both were much reduced. In 2013 the Jefferson PSC re-treated Spencer Creek from US 101 to the mouth, except for one parcel for which we still do not have permission. Although herbicide usage was greatly reduced, poor documentation by the crew made it difficult to determine if this was because of reduced amount of plants or whether they failed to search in all permissioned sites.

In **2014** the CCNWCB treated 1.7 miles of the river for knotweed. They also found and treated trace amounts of yellow archangel and giant hogweed. Herbicide totals in the table below only include knotweed totals

| Herbicide Use, Spencer Creek (gal) | | | | |
|---|-------------|-------------|-------------|-------------|
| | 2011 | 2012 | 2013 | 2014 |
| <i>Parcels</i> | | | | |
| <i>Herbicide use</i> | 1.69 | 3.29 | 0.32 | 0.19 |

Dosewallips River

The Dosewallips River is one of the largest rivers in Jefferson County. It flows east from the Olympic Mountains into the Hood Canal at the town of Brinnon. It drains approximately 130 square miles and includes close to 132 miles of streams and tributaries. Out of the 130 square miles, 93% is contained within the Olympic National Park and Olympic National Forest. Land use of the remaining 7% is rural residential, commercial, and private forested land. The Dosewallips River supports Chinook, steelhead and Hood Canal Summer Chum, the last of which are listed as Threatened under the Endangered Species Act.

In 2006 Jefferson County Noxious Weed Control Board (JCNWCB) surveyed the Dosewallips. CCNWCB provided training, herbicide and equipment. Treatment took place from 2007 through 2009, using a combined JCNWCB/CCNWCB crew. In 2010 the East Jefferson WCC crew began additional surveys along the left, more accessible bank of the Dosewallips, finding more sites than previously, and more upstream sites. Most sites found in 2010 were treated by the same crew. Re-treatments took place in 2011 and 2012. Drier conditions in 2012 allowed surveying and treatment on the right bank for the first time.

In 2013 the East Jefferson County WCC (EJWCC) crew, funded by HCSEG again surveyed and treated along both banks of the river mainstem. Knotweed infestation along the river consisted of smaller patches in the upper reaches and slightly larger patches toward the lower river. Continued outreach efforts produced a few new property owner consents. Knotweed re-growth showed a significant decrease from previous years; very little or no knotweed remained where it previously grew above the lower two miles of the river. CCNWCB crews also worked on the Dosewallips especially on the upper reaches where there are private landowner in-holdings in the Olympic National Forest. For the first time, the county had access to crews (Clallam and Jefferson PSC) for work on other weeds besides knotweed. Both CCNWCB and two PSCs treated extensive herb Robert infestations in the upper reaches of the Dosewallips along with knotweed. Additionally, the two PSCs began treating severe butterfly bush and Scotch broom infestations on private land near the mouth of the river.

In 2014, CCNWCB, PSC, and EJWCC continued their knotweed control efforts along some 13 miles of the Dosewallips. The DNR funded-PSC expanded on work done near the river mouth to include several gravel bars and the south bank, plus re-worked areas from the previous year. During the course of this work, they discovered and treated several patches of knotweed amid the jungle of butterfly bush. Herbicide use for non-knotweed treatments is not included in the following table.

| Herbicide Use-Dosewallips River (gallons) | | | | | | | | | |
|--|--------------|--------------|-------------|--------------|-------------|-------------|--------------|-------------|--------------|
| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Acres Treated | 2 | 5 | 7.75 | 5.5 | 14.05 | 0.3 | 0.57* | 5 (est) | 1.3 |
| AquaNeat injected | 0.77 | 3.175 | 0.8 | 0 | 0 | 0 | 0.031 | 0 | |
| AquaNeat sprayed | 0.375 | 3.2 | 3.12 | 0.234 | 8.48 | 0.58 | 1.443 | 1.56 | .007 |
| Polaris AQ sprayed | 0 | 0 | 0 | 0 | 0.02 | 0 | 0.02 | 0.003 | .03 |
| Total Herbicide | 1.145 | 6.375 | 3.92 | 0.234 | 8.5 | 0.58 | 1.494 | 1.56 | 0.037 |

Duckabush River

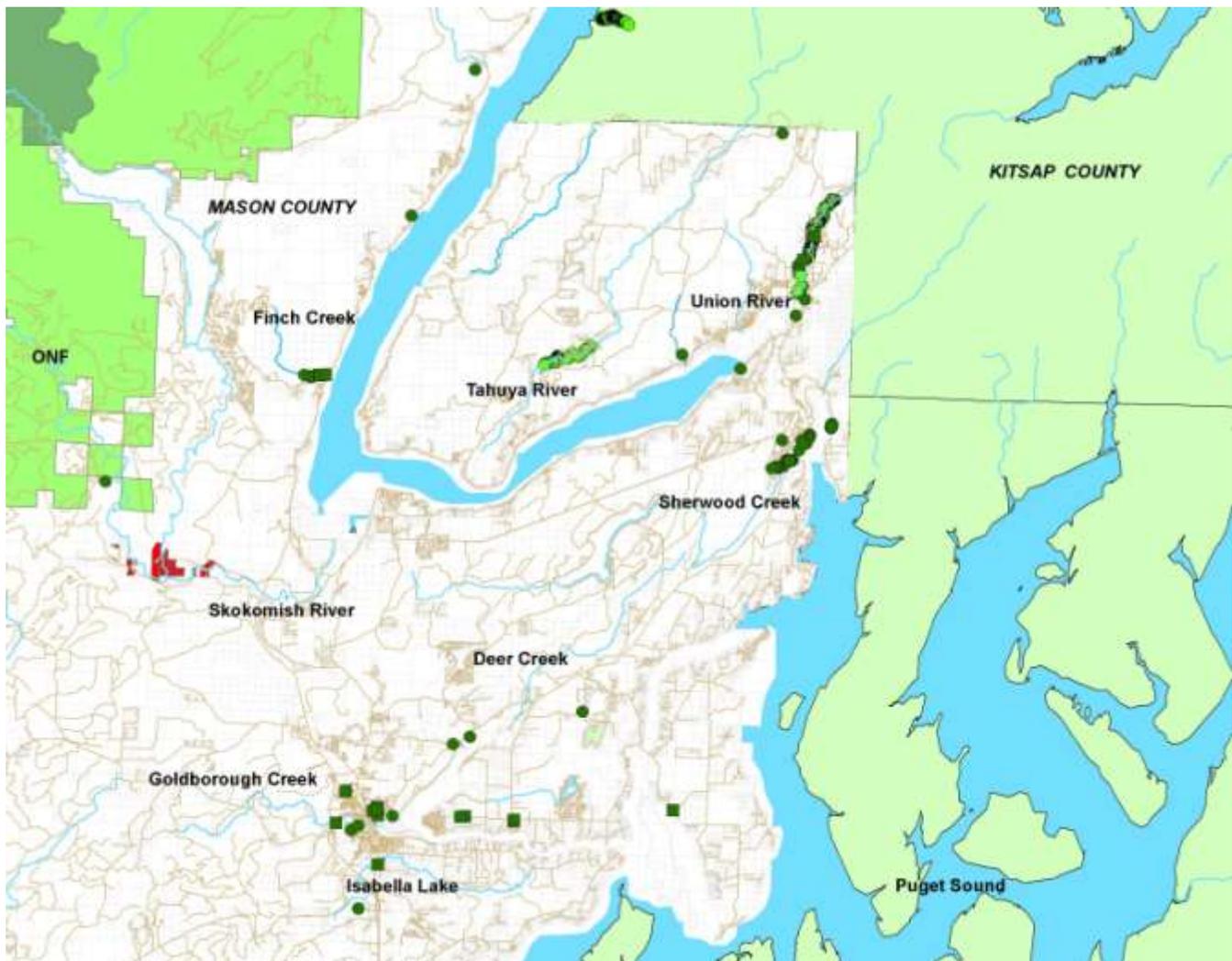
The Duckabush is one of the major waterways in Jefferson County. It originates near Mount Duckabush, within Olympic National Park, flowing into the Hood Canal south of the town of Brinnon. It is 24.5 miles long with over 50 tributaries contributing an additional 94 stream miles. The watershed covers an area of approximately 75 square miles. The upper watershed, lying within the National Park, has been minimally logged and is used recreationally for hiking and camping. The lower 3.4 miles are accessible to salmon and support populations of Chinook, coho, chum and pink salmon, as well as steelhead and searun cutthroat.

In 2006 windshield and foot surveys were conducted on the Duckabush River. No knotweed plants were found. In 2007 a landowner off channel notified us of knotweed on his property, which we treated. This site was re-treated in 2008, 2010 and 2012. In 2012, HCSEG funded another complete survey of the river. No knotweed was found. In 2013 the CCNWCB/JCNWCB crew re-treated the small off channel patch of about 10 plants near the mouth. Despite re-treatments over many years, this patch remains inexplicably undiminished.

Due to small levels of infestation, no knotweed treatments occurred in **2014**.

| Herbicide Use, Duckabush off-channel site | | | |
|--|-------------|-------------|-------------|
| 2011 | 2012 | 2013 | 2014 |
| 0 | 0.01 | 0.0008 | 0.00 |

PROJECT ACTIVITIES BY WATERSHED—CONTINUED MASON COUNTY



Light green circles indicate sites treated by East Jefferson WCC crew, funded by HCSEG. Blue circles indicate knotweed sites, blue squares indicated hogweed sites treated by MCNWCB and/or the Mason PSC. Parcels in red on the Skokomish River indicate treatment by Mason CD

Tahuya River

Crew— Hood Canal Salmon Enhancement Group and East Jefferson WCC

The Tahuya River is the largest stream on the Kitsap Peninsula, draining 45 square miles of land. The mainstem is 21 miles long with an additional 65 miles of tributaries. The numerous tributaries are an important factor in the Tahuya's ability to produce large numbers of coho salmon. In 2010 the first knotweed survey on the Tahuya found small intermittent patches. Access to the river is difficult, due to large undeveloped parcels and its remoteness. Complete treatments of known (98 properties) knotweed patches were conducted in 2010, 2011 and 2012, and 2013.

2014 was the fifth consecutive year of knotweed surveys and treatments on the Tahuya River mainstem. Remaining infestations are small isolated patches. Because of multiple years of treatment and little re-growth during 2013, it was decided not to treat the lower river parcels this season. Knotweed re-growth in the upper reaches continued to decline from previous year treatments. 0.3 gallons of glyphosate were used on the Tahuya River in 2014 compared with 8.3 gallons in 2013. Native re-vegetation planting efforts occurred on four large properties utilizing only Sitka Spruce and Western Red Cedar bringing the total to 10 replanted sites. Planting

plans have been established for additional properties during the 2014/15 winter months in addition to maintenance of existing plantings.

Union River

Crew—*East Jefferson WCC, Mason County NWCB and Mason PSC*

The Union River enters Lynch Cove at the terminus of the east arm of Hood Canal, draining 24 square miles of land. The mainstem is 10 miles in length with 30 miles of tributaries. The Union Reservoir supplies up to 5 million gallons of water per day to the City of Bremerton and the Puget Sound Naval Shipyard. The Union River is the only watershed in west WRIA 15 and north WRIA 14 to support a healthy run of summer chum salmon. Knotweed survey and control on the Union River began in 2009 and has continued each year since (permission on 99 parcels). Two landowners with whom HCSEG has not gained permission are now working with the Mason County NWCB.

2014 is the sixth consecutive year of knotweed surveys and treatment along the river mainstem and tributaries. Knotweed re-growth is sparse and continues to decline. Crews have noted other noxious weeds such as giant hogweed, spotted jewelweed and policeman's helmet encroaching into areas where knotweed has been controlled or eliminated. Native plant re-vegetation efforts continued and were maintained on 11 properties along the upper and lower reaches of the river and tributaries. Planted vegetation focused on native coniferous trees, and includes deciduous trees and shrubs along the river's riparian zone for erosion control and habitat complexity.

Dewatto River

Crew— *East Jefferson WCC*

The Dewatto River enters Hood Canal about 5.5 miles north of the Great Bend of Hood Canal, draining about 23 square miles. The mainstem is 8.7 miles in length with about 30 miles of tributaries. Several wetlands are present near the mouth, providing quality rearing habitat for juvenile salmonids. Although logging was historically the dominant land use and much of the watershed is still managed for timber production, the estuary remains relatively undisturbed. Knotweed survey and control on the Dewatto River began in 2009 and has continued each year since. Access is relatively easy in the lower reaches as the main road runs along the river. In the upper reaches there is a fairly large gap between the road and the river, often separated by wetlands or thick woods, making access more challenging. Knotweed in the Dewatto River is found in smaller patches spread intermittently throughout the river. All known knotweed patches were treated in 2009, 2010, 2011, 2012 and 2013.

In 2013 only 0.123 gallons of herbicide were used to treat knotweed on the Dewatto. Because previous year's treatments showed very little re-growth it was decided to delay treatments **until 2015**.

For more information about the Tahuya, Union or Dewatto Rivers please contact Mendy Harlow, 360-275-9722 mendy@hcseg.org or Michelle Myers, 360-275-9722 michelle@pnwsalmoncenter.org

Skokomish River

Crew—*Mason County Conservation District*

The Skokomish River drains a basin of about 247 square miles. It empties into Annas Bay in southern Hood Canal near Potlatch, Washington. The upper reaches of the Skokomish River lie within the Olympic National Park. The North Fork basin includes Lake Cushman, a reservoir maintained for hydroelectric power generation. The entire basin is sparsely populated and rural; it provides important habitat to a variety of terrestrial wildlife such as elk, deer, beaver, and waterfowl. Wildlife, shellfish, and finfish are important cultural and economic resources for the Tribe. The Skokomish River system provides valuable habitat for important species of fish such as Chinook, Coho, and chum salmon; steelhead; and various trout. From 2010 to 2012 the Mason Conservation District (MCD) treated knotweed on the Skokomish River. In 2012 crews focused on taking a systematic top-down approach to treatment, and almost 43 acres were treated.

In 2013 the Conservation District treated knotweed on 29 parcels in the Skokomish Valley, which is a large area with a high level of infestation. To improve efficiencies MCD adopted a new method of documenting knotweed infestation and treatment which will make it difficult to compare this and future treatments with past years. There was a huge reduction in herbicide use, from 143.25 (2012), to 16.84. Some of the reduction is due to efficacy of previous years, but also because of foliar application instead of injections.

The MCD also contracted with the Squaxin Island Tribe to treat knotweed in the Skookum Creek Watershed. There they surveyed 38 parcels, 2.79 miles of stream, and 39.34 acres and treated 20 parcels and 1.05 acres.

In **2014** the MCD reported assisting 20 landowners on 24 parcels in the Skokomish Valley as seen as red polygons on the map. No other details were provided.

For more information about the Skokomish River please contact Evan Bauder at the Mason Conservation District, 360-427-9436 ext 13 or evan@masoncd.org

Other Mason County Sites

Crew—MCNWCB and the Mason PSC

In 2013 Mason County was able, for the first time, to utilize a Puget Sound Corps (PSC), funded by the DNR. (See Page 9 for more information about PSC). Many knotweed sites throughout Mason County were treated. Large concentrations of knotweed on Sherwood Creek and Finch Creek were treated for the first time, mainly with injections of Aquaneat. A “top-down” strategy was used, which will be continued in 2014. The PSC also treated large stands of knotweed on Stimson Creek, at the Davis Farm on the Union River, and a number of upland sites. Other small Mason County sites were treated by Mason County Noxious Weed Control Board and/or the PSC crew. These include sites on Waketickeh Creek, Goldborough Creek, North Bay, Oakland Bay and some upland sites.

In **2014** MCNWCB, with the help of a DNR-funded PSC crew was able to treat a combined 10.52 acres of knotweed (3.94 solid acres) on 39 parcels along 1.74 miles of river. Knotweed was treated around Allyn, Finch and Sherwood Creeks, Union River, Lake Isabella and North Bay as well as some upland sites. All treated sites are shown on the watershed overview map above. With the help of the PSC, the MCNWCB directed the treatment of well over 120 acres of a variety of other noxious weeds growing in riparian areas. Herbicide totals for 2014 were not available.

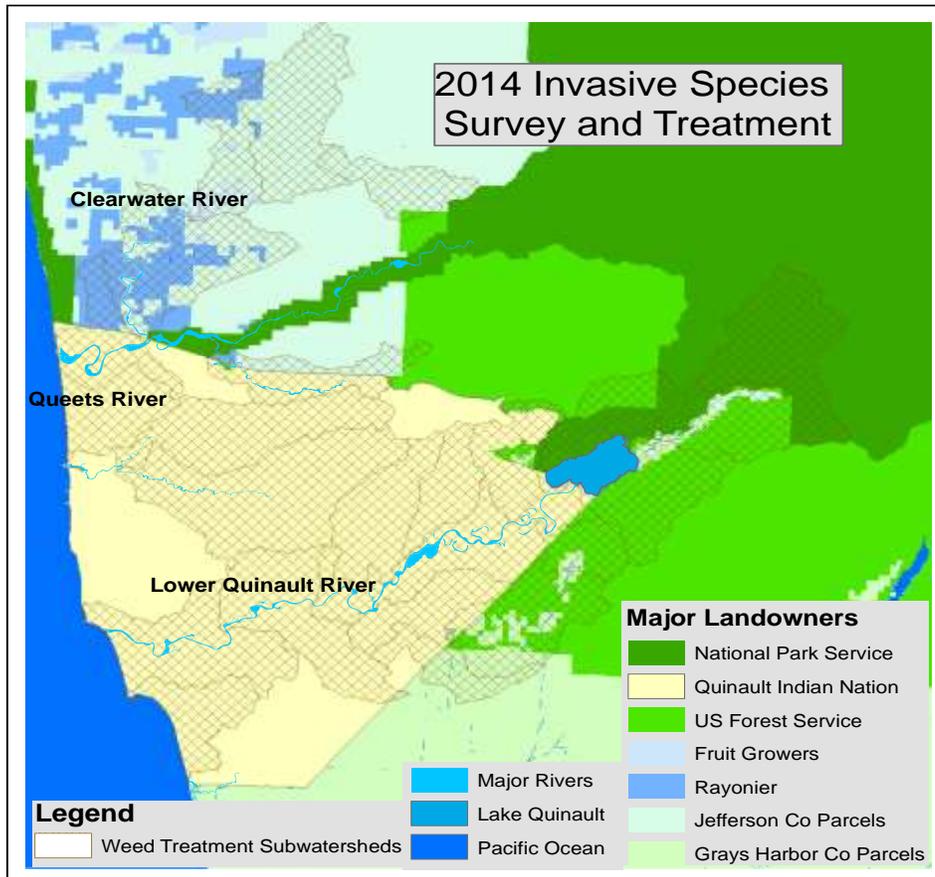
| Herbicide Use, Mason County, 2013 (gal) | | |
|--|---------------------|------------------------------------|
| | Glyphosate injected | Glyphosate and/or imazapyr sprayed |
| Skokomish River | 0 | 16.84 |
| Tahuya River | 0 | 8.3 |
| Union River | 5.69 | 8.55 |
| Dewatto River | 0 | 0.123 |
| Finch Creek | 2.06 | 0.03 |
| Stimson Creek | 3 | 1.15 |
| Sherwood Creek | 3.23 | 0 |
| Other riparian sites | 1.32 | 0.85 |
| Terrestrial sites | 1.54 | 1.33 |
| Total | 16.84 | 37.173 |

On the three rivers where treatment has been on-going for several years, treatment was mainly foliar spray—the exception being the Davis Farm on the Union River. On Finch, Stimson and Sherwood Creeks, where treatment was mostly first-time, treatment was mainly injection.

For more information about Mason County work, please contact Pat Grover, 360-427-9670 ext. 592 patriciaq@co.mason.wa.us

PROJECT ACTIVITIES BY WATERSHED—CONTINUED WEST JEFFERSON COUNTY AND GRAYS HARBOR COUNTY

Quinault River, Lake Quinault, Queets and Clearwater Rivers



The crossed hatched polygons indicate the Quinault Indian Nation's Project Area. The entire project encompasses 227,774 acres. (Map produced by QIN invasives control coordinator Caroline Martorano)

The Quinault River, Lake Quinault and the Queets-Clearwater watershed are all included in WRIA 21. This WRIA contains some of the last remaining free-flowing large rivers in the lower 48 states. It contains areas of habitat that are relatively pristine (especially those within the Olympic National Park), as well as areas that have been greatly affected by logging and other activities over the last century. The entire WRIA is included in the Quinault Indian Nation's (QIN) Usual and Accustomed Fishing and Hunting Area. It is a rural, sparsely-populated area where land ownership is dominated by ONP, USFS, Washington Department of Natural Resources and large timber companies. Unlike the protected marine and estuarine environments of Puget Sound and the Hood Canal, these streams drain directly into the Pacific Ocean. Ocean survival is less for fish leaving these coastal streams, making in-stream survival of juvenile fish more significant.

The Quinault River, tributaries and floodplain, Lake Quinault and Prairie Creek

Crew—Total Vegetation Management and Brittlund Company crews, led by Caroline Martorano, Quinault Indian Nation staff.

The Quinault River is 69 miles long and originates in the Olympic National Park. It flows into and out of Lake Quinault and empties into the Pacific Ocean at Taholah. The Quinault River has healthy stocks of sockeye and also supports Chinook, chum and Coho. The upper reaches offer spawning and rearing habitat for federally-listed bull trout. Prairie Creek is located near the outfall from Lake Quinault and is a source of knotweed infestation in the lower Quinault River.

In 2007 the Quinaults received a SRFB grant for five years of knotweed control on **Prairie Creek** and work has taken place each year since. 2011 was the final year and the grant was amended to include the North Shore of Lake Quinault and Amanda Park. The Prairie Creek treatments have been successful and natural vegetation is establishing. In 2010 the Quinaults were awarded a SRFB grant for knotweed survey and control in the **lower Quinault River**. The lower watershed has 68,000 acres of tributaries, 600 miles of roads, 300 miles of streams and many harvest units and gravel mines. It also includes the town of Neilton, which was found to have large knotweed infestations that were being spread by mowing, cutting or dumping and was obviously another source for the lower Quinault River infestation. Most of the sub-watersheds were surveyed and treated in 2010. Treatment continued in 2011 and there was a marked reduction in size of plants in previously treated areas. The Lower Quinault project area encompasses 63,000 acres.

In 2011 the upper Quinault River, above the lake, was surveyed and treated by the North Cascades EPMT with NPS and by Grays Harbor NWCB. In 2012 the Lower Quinault Tributaries were treated for the first time, by the QIN crew. In 2013 the Quinaults did a first-year treatment of the Lower Quinault floodplain. They surveyed over 1,000 acres. Dense stands of knotweed on over 43 acres were treated. The Lower Quinault tributaries were also treated, for a second year. Over 12,000 acres were searched for knotweed. Re-vegetation was begun—conifers were planted on some of the Lower Quinault Tributaries. Knotweed in the town of Neilton was re-treated by the QIN crew. The North Cascades EPMT with the National Park Service treated knotweed on the upper river, above Lake Quinault.

In **2014**, Brittlind Company treated invasive species on Quinault Reservation in Joe Creek, Boulder Creek, 10 o'clock Creek, South Boulder Creek, harvest units, roads, pits and part of the upper river above Lake Quinault. Total Vegetation Management treated knotweed and reed canarygrass in Prairie Creek, Neilton, boat launches and the Lower Quinault floodplain from Lake Quinault downstream 8 river miles. The Lake Quinault area was treated by 10,000 Years Institute. 10,000 Years Institute also was instrumental with most of the project areas.

Queets-Clearwater Watershed

Crew—Brittlind Company & Total Vegetation Management, led by Jill Silver of 10,000 Years Institute

The Queets River is 53 miles long and is mainly within the boundary of the Olympic National Park. The last four miles, outside the Park, are within the Quinault Indian Reservation. The Queets supports stocks of Chinook, Coho, chum and steelhead; additionally, the upper reaches offer spawning and rearing habitat for federally-listed bull trout. The Clearwater, which is 39 miles long, is one of the main tributaries. It joins the Queets at approximately RM 4, as the Queets leaves the National Park. It also supports stocks of most salmon species. Conservation efforts are underway on the Clearwater.—The Nature Conservancy recently purchased 3,088 acres.

In 2011 the Quinaults received a **3-year EPA grant** (2 seasons of knotweed control) for detection and treatment on the Queets and Clearwater. Jefferson County NWCB was contracted to obtain landowner permissions. The project area covers 153,000. The survey was 2/3 completed in 2011, the source of knotweed on the Clearwater River was located and only one site was found on the Queets. In 2012 crews treated all previously recorded knotweed infestations and completed surveys and treatment along the remaining length of the Queets and Clearwater rivers. The surveys covered 23.95 river miles, and approximately 1040 acres. The total area treated was 2.25 acres. In 2013 known sites on the Queets and Clearwater were re-treated and other invasive plant species were GPS'ed. Significant decrease in knotweed was noted on the Clearwater River, upstream from the town of Clearwater.

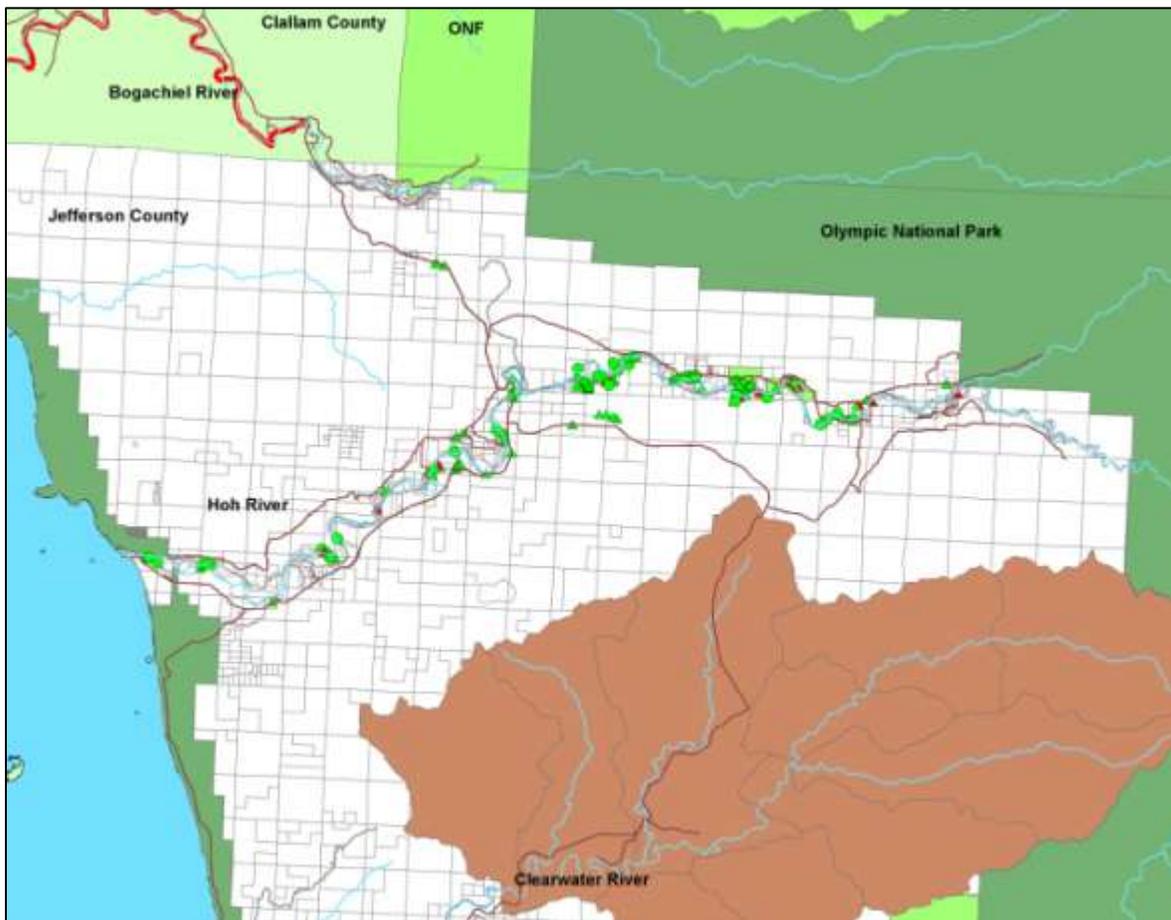
In **2014**, Brittlind Company and 10,000 Years Institute treated the invasive species mapped in 2013 in addition to the little remaining knotweed. Total Vegetation Management and 10,000 Years Institute treated knotweed and reed canarygrass at the mouth of the Queets.

The Quinaults are now working with multiple sources of funding—Salmon Recovery Funding Board, Environmental Protection Agency (Clean Water Act), Natural Resource Conservation Service and the United States Fish and Wildlife Service.

For more information about knotweed treatment on Quinault, Queets and Clearwater Rivers, please contact Caroline Martorano, at 360-276-8215 or cmartorano@quinault.org .

Hoh River

Crew—10,000 Years Institute and Pacific Coast Salmon Coalition



Green circles indicate 2014 knotweed treatment. Green triangles indicate other invasive species, (58% of all treatments were for reed canarygrass). Red triangles indicate herb Robert. The brown polygon denotes a portion of Quinault Indian Nation project areas.

The Hoh River Knotweed Control Project has been underway in the Hoh watershed since 2001. The 300 square mile watershed is famous for wild stocks of winter steelhead, fall Coho, and spring/summer and fall Chinook salmon. Restoration and maintenance of a functional mature riparian forest is considered a primary component of a salmon recovery strategy by the WRIA 20 salmon recovery and watershed planning groups, and knotweed eradication is critical to that outcome. The Hoh knotweed infestation initiated from a single clump, identified by Hoh Tribe field staff in 1999, located at an old homestead near the Olympic National Park (river mile 30). The clump was eroded and spread down the river during a winter flood. By the end of 2003 18,585 canes, in 1,247 sites widely dispersed over 20 river miles had been documented and treated. Annual surveys and re-treatments of the 30 mile river corridor have been conducted since 2003 by 10,000 Years Institute in partnership with the Hoh Tribe, Hoh River Trust, and ONP. Knotweed plant density and distribution continues to be reduced, and most remaining plants are now less than 3' in height.

In 2013 10,000 Years Institute and crew from Pacific Coast Salmon Coalition began fieldwork at the end of July with two days of donated airboat time on the Hoh River's mainstem river channel and banks. Surveys and treatment continued as weather permitted through mid-October; covering river bars, riparian thickets and floodplain forests within the river's floodplain. The project surveyed approximately 65% of the total project area from River Mile (RM) 30 to RM 0. Knotweed surveys and treatment took place on right bank sites from river mile 30.35 to 15 (Upper Brandeberry to the Hoh Oxbow). Left bank surveys and treatment were conducted from RM 23 to 1 (Clear Creek to Braden Creek). Scattered Bohemian, Japanese, and Giant knotweed was observed; without flowers. The majority of plants were under 6' in height. Scotch broom was pulled on four days with

correctional crews, and herb Robert was pulled in many locations, and sprayed at two sites. Reed canarygrass has spread exponentially; seed heads were pulled, clumps were bundled and sprayed along Elk Creek, and along the Hoh River at many small sites from RM 29.75 to RM 1. 49 gallons of spray using aquatically-labeled imazapyr (Habitat or Polaris) at 1% were applied to 1.13 acres of treated sites within the 2500 surveyed acres of river floodplain. The project received funding from the SRFB and WSDA Knotweed Program.

In **2014**, 10,000 Years Institute and hardworking crew from the Pacific Coast Salmon Coalition began fieldwork on the Hoh River and tributaries in mid- July. The river was too high for knotweed, and the plants too small, so we began with reed canarygrass inventories and seed-collecting in Elk Creek, an important coho and steelhead spawning and rearing tributary in the middle of the watershed. At the end of July, we conducted two days of raft surveys from RM 25 to RM 0.5, locating and treating some of the largest remaining knotweed clumps on the river. Surveys and treatment continued as weather permitted through early-October; gridding river bars, riparian thickets, and floodplain complexes and forests within the river's floodplain, as well as four additional tributaries – Winfield, Alder, Lost and Braden creeks. Tributary surveys went downstream from Highway 101 or the Hoh Clearwater Mainline to the river, in search of reed canarygrass and other species moving off roadsides. The project surveyed approximately 85% of the total project area from River Mile (RM) 30 to RM 0. Surveys and treatment took place on right bank sites from river mile 30.35 to 0.25 (Upper Brandeberry at the boundary of Olympic National Park to RM 0.5). Left bank surveys and treatment were conducted from RM 30.35 to 0.25 (Brandeberry Lots to the Hoh Reservation). Scattered Bohemian knotweed in a variety of leaf shapes, sizes and colors were observed; 99.9% without flowers. 65% of knotweed stems were under 3' in height, 25% from 3 to 6 feet, and 5% greater than 6 feet. Knotweed comprises only 18% of treated sites this year. Scotch broom was pulled during surveys as possible, and herb Robert was inventoried at 96 sites, pulled in many locations, and sprayed at 15 sites. Reed canarygrass was more broadly distributed this year than last, comprising 58% of all treated sites. Small clumps are located along river side channels on banks and terraces, moving via water and beavers. Seed heads were cut and bagged, and clumps were bundled and sprayed along Elk Creek, and along the Hoh River at 477 sites from RM 30 to RM 0.25. Despite the increase, we estimate that the distribution has peaked; seeds have been removed as part of our treatment protocol for the past two years. We found herb Robert and reed canarygrass in Lost Creek, Braden Creek, and Elk Creek – but not in Alder or Winfield creeks. A total of 90 gallons of spray using aquatically-labeled imazapyr (Polaris) and glyphosate (AquaNeat) at 1% were applied to 3.82 acres of treated sites within the 3450 surveyed acres of river floodplain. Funding was provided by the SRFB for knotweed and reed canarygrass, and from WSDA for ED/RR on other focal species.

| Herbicide Use, Hoh River (gallons) | | | | | | | |
|---|----------------|--------------|--------------|-------------|-------------|--------------|--------------|
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Acres Treated | 1093 | 1000 | NA | 0.16 | 0.14 | 0.11 | 3.82 |
| AquaMaster or AquaNeat Injected | 0.0151 | 0.188 | 0.25 | 0.13 | 0 | 0 | 0 |
| AquaMaster or AquaNeat Sprayed | 0.5645 | 0.13 | 0.78 | 0.73 | 0.37 | 0 | 0.153 |
| Polaris AQ or Habitat Sprayed | 0.06382 | 0.043 | 0.206 | 0.02 | 0.09 | 0.145 | 0.745 |
| Total Herbicide | 0.64342 | 0.361 | 1.247 | 0.88 | 0.46 | 0.145 | 0.898 |

For more information about knotweed treatment on the Hoh River, please contact Jill Silver, 10,000 Years Institute, at 360-385-0715 or jsilver@10000yearsinstitute.org .

Table 1. Work by County-by Watershed

This table includes information gathered from multiple agencies working on knotweed projects across the Olympic Peninsula. Not all entities known to control knotweed and other invasive plants submitted information. Information submitted by different agencies was not always comprehensive; this is shown as N/A or not available. The table is organized in the following order Clallam, Jefferson, Mason and Grays Harbor, by watershed, in generally the same order as narratives earlier in this report-clockwise, starting in west Clallam County. (This order is a historic reflection of where work first occurred). Multiple agencies may have worked within the same watershed. Distinct information is shown per individual organization, then summed at the end of the County section to which it applies. An explanation of agency acronyms can be found at the end of the table along with definitions of terms used in the header column. Additional invasives that were controlled during the course of a project are shown when known, but not added to the knotweed totals. Instead, work on other invasives by the same organization is shown separately, directly below the knotweed information.

| Agency | Watershed/ Waterway | River /Shore Miles | Acres Protected | Acres Treated | Solid Acres | Parcels Treated/ Survey | Total # of Permissioned Parcel | # Landowners Assisted | # New Agreements | Species/misc notes |
|---|--|--------------------------|--------------------|------------------|----------------|-------------------------------|--------------------------------------|-----------------------------|------------------------|---|
| Clallam County Waterways-Starting West Clallam clockwise to East Clallam | | | | | | | | | | |
| QNR | Bogachiel River | 7.63 | 46.24 | 46.24 | 0.57 | N/A | N/A | N/A | | knotweed spp. |
| QNR | Dickey River | 13.00 | 343.00 | 343.00 | 3.17 | N/A | N/A | N/A | | knotweed spp. |
| NCCNEPMT | | N/A | N/A | .65 | N/A | | N/A | 1 | | |
| CCNWCB | Big River and Hoko-Ozette Rd | 4.60 | 31.00 | 10.00 | 0.55 | 14/21 | 34 | 19 | 1 | knotweed spp. |
| NCCNEPMT | | N/A | N/A | .002 | N/A | N/A | | 1 | | |
| CCNWCB | Hoko River | 0.02 | 1.5 | 0.2 | 0.01 | 1/1 | 31 | 1 | 0 | knotweed spp.- yellow archangel, herb Robert |
| CCNWCB | Sekiu River | 1.50 | 11.21 | 1.68 | 0.07 | 5/13 | 13 | 10 | 3 | knotweed spp. |
| CCNWCB | Sekiu, Clallam Bay and Highway 112 | 3.10 | 50.00 | 3.31 | 0.15 | 8/68 | 8 | 6 | 8 | knotweed spp. |
| | Clallam River | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | |
| CCNWCB | Pysht River | 3.29 | 35 | 8 | 0.02 | 3/3 | 15 | 1 | 1 | knotweed spp. |
| DNR-PSC | | 0.12 | 6.5 | 5 | 2.4 | 2/2 | | 1 | | burdock, Canada thistle, herb Robert reed canarygrass, holly |
| NCCNEPMT | Sol Duc River* | N/A | N/A | 0.005 | 0 | 0 | 3 | 0 | 0 | Himalayan knotweed and other sites that were combined w misc sites |

| Agency | Watershed/ Waterway | River /Shore Miles | Acres Protected | Acres Treated | Solid Acres | Parcels Treated/ Survey | Total # of Permissioned Parcel | # Landowners Assisted | # New Agreements | Species/misc notes |
|------------------------|---|--------------------------|-----------------------|---------------------|---------------------|-------------------------------|--------------------------------------|-----------------------------|------------------------|--|
| | Lake Creek, Lake Pleasant and Beaver | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | Not treated this year |
| | Forks | | 0 | 0 | 0 | 0 | 3 | 3 | 0 | None reported |
| | Deep Creek | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | |
| | Nordstrom Creek | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 4 | |
| | Salt Creek | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 10 | |
| LEK-WCC, ONP-WCC | Elwha River | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0 | Considerable work occurred here but specific data not supplied |
| DNR-PSC | Valley Creek | 1.14 | <u>11.91</u> | <u>3.2</u> 7.5 | <u>.09</u> .63 | <u>6/11</u> 5/--- | 11 | 4 | 1 | knotweed spp. purple loosestrife, teasel, herb Robert, Scot's broom |
| CCNWCB | Peabody Creek | 0.05 | 2.00 | 0.50 | 0.10 | 2/2 | 29 | 1 | 0 | knotweed spp. |
| CCNWCB | Ennis Creek | 0.65 | 3.93 | 0.25 | 0.02 | 2/2 | 41 | 2 | 0 | knotweed spp. |
| NCCNEPMT | | N/A | N/A | 0.005 | N/A | | | 1 | | |
| CCNWCB & DNR PSC | Lees Creek | 1.04 | 6.32 | 2.45 | 0.49 | 17/18 | 28 | 18 | 2 | knotweed spp. |
| | East Fork Lees Creek | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | |
| CCNWCB | Morse Creek and adjacent Straits of Juan de Fuca | <u>3.99</u> 0.50 | <u>24.17</u> 3.03 | <u>0.50</u> 0.50 | <u>0.15</u> 0.32 | <u>3/3</u> 4/4 | <u>53</u> | <u>2</u> 2 | <u>0</u> 1 | knotweed spp. 1 yellow archangel |
| CCNWCB | Bagley Creek | 0.87 | 5.27 | .35 | 0.003 | 10/10 | 52 | 2 | 0 | knotweed |
| | Siebert Creek | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | |
| DNR-PSC See notes | Bell Creek | | 0.10 | 0 | 0 | 0 | | | | No knotweed seen this season other weed treatments took place downstream |
| DNR-PSC | Dungeness River | <u>0.27</u> .17 | <u>15.00</u> 39.90 | <u>7.00</u> 33.5 | <u>0.14</u> 3.68 | <u>10/10</u> 7/7 | N/A 7 | <u>4</u> 3 | <u>4</u> 1 | knotweed spp. 1 poison hemlock, wild |

| Agency | Watershed/ Waterway | River /Shore Miles | Acres Protected | Acres Treated | Solid Acres | Parcels Treated/ Survey | Total # of Permissioned Parcel | # Landowners Assisted | # New Agreements | Species/misc notes |
|---|---|--|-----------------------------|-----------------------------|---------------------------------------|---------------------------------------|--------------------------------------|-----------------------------|-------------------------|---|
| NOSC/ Jefferson WCC/* | | N/A | N/A | N/A | N/A | N/A | 60* | N/A | 56* | carrot, Canada thistle, teasel butterfly bush*-see watershed notes about NOSC project |
| DNR-PSC | Meadowbrook Creek | <u>0.09</u> | <u>19.00</u> 8.25 | <u>1.8.25</u> 8.25 | <u>0.12</u> 2.10 | <u>1/1</u> 2/2 | <u>1</u> 2 | <u>1</u> | <u>0</u> | knotweed spp. tree lupine, Canada thistle, reed canarygrass |
| CCNWCB | Misc Clallam County | | 2.95 | 0.42 | 0.10 | 9/9 | 9 | 9 | 8 | knotweed spp. |
| KW Sub totals | CCNWCB/DNR PSC | <u>20.61</u> | 219.26 | <u>39.67</u> | <u>2.013</u> | <u>99/178</u> | 483 | <u>91</u> | <u>30</u> | |
| | OTHER WEEDS | 0.79 | 49.43 | 39 | 6.4 | <u>11/11</u> | 11 | | | |
| | QNR NOSC, Jamestown S'Klallam, LEK WCC_ ONP-WCC, NCEPMT | <u>20.63</u> N/A N/A Not shown | <u>389.24</u> N/A N/A | <u>389.24</u> N/A N/A | <u>3.74</u> N/A N/A | <u>N/A</u> N/A N/A | <u>N/A</u> 60 N/A | <u>N/A</u> N/A N/A | <u>N/A</u> 56 N/A | |
| Clallam Co. Totals | 9 entities/16 waterways | >41.24 | >608.5 | >428.91 | 5.753 kw >6.4 oth | >99/178 >11/11 | >543 | >91 | 86 | |
| Jefferson County Waterways-Starting East Jefferson clockwise to West Jefferson | | | | | | | | | | |
| NOSC | Snow Creek | N/A | N/A | N/A | N/A | N/A | 1 N/A | 0 N/A | 0 N/A | No knotweed treatments blackberry |
| | Port Townsend | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | |
| | Lake Leland | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | |
| HCSEG/ EJCWCC | Big Quilcene River | 5.54 | 67.15 | 5 | .333 | 25/30 | 50 | 26 | 1 | knotweed |
| CCNWCB HCSEG/ EJCWCC | Little Quilcene River | <u>.005</u> 0.10 | <u>0.50</u> 1.00 | <u>0.25</u> 0.01 | <u>0.002</u> 0.001 | <u>1/1</u> 1/1 | <u>4</u> 1 | <u>1</u> 1 | <u>0</u> 0 | knotweed knotweed |
| CCNWCB | Quilcene and vicinity | .09 | 1.5 | .75 | .11 | 3/3 | 3 | 2 | 0 | knotweed spp. |

| Agency | Watershed/ Waterway | River /Shore Miles | Acres Protected | Acres Treated | Solid Acres | Parcels Treated/ Survey | Total # of Permissioned Parcel | # Landowners Assisted | # New Agreements | Species/misc notes |
|---|----------------------------|------------------------------|-----------------------------|--------------------------|-----------------------------|-------------------------------|--------------------------------------|-----------------------------|------------------------|--|
| | Tarboo Creek | 0 | 0 | 0 | 0 | 0 | 5 | 0* | 0 | Possible treatments by other entity, but not reported to OKWG |
| CCNWCB | Spencer Creek | <u>1.69</u> | <u>10.24</u> | <u>2.05</u> 0.45 | <u>0.43</u> 0.08 | 5/16 | 16 | 4 | 0 | knotweed spp. yellow archangel |
| CCNWCB/ DNR-PSC HCSEG/ EJCWCC DNR-PSC | Dosewallips River | <u>10.07</u> <u>13.40</u> | <u>61.01</u> <u>81.2</u> | <u>1.6</u> <u>.11</u> | <u>0.07</u> <u>0.013</u> | <u>6/6</u> 9/21 | <u>32</u> 77 | <u>6</u> 30 | <u>2</u> | 2 knotweed spp. knotweed spp. 2 butterfly bush, tansy ragwort, herb Robert, Scot's broom, everlasting peavine |
| | <i>Duckabush River</i> | | | | | | 3 | 0 | 0 | <i>Other invasives w/in FS only treated</i> |
| QIN | Queets/ Clearwater | N/A | N/A | N/A | N/A | N/A | 180 (est) | 117 | 0 | See Grays Harbor Waterway notes |
| 10KYI/ PCSC | Hoh River & tribs | 32.00 | 3420 | 1633 | <u>.31</u> 1.40 | N/A | 200+ | 11 | 0 | Knotweed-est Reed canarygrass, Canada thistle, European blackberry, everlasting peavine- NOTE: does not include infested totals for manual removal of Scot's broom, tansy ragwort, jewelweed, and thistles |
| KW Sub totals | CCNWCB/DNR PSC | 11.855 | 73.25 | 4.65 | 0.61 | 12/23 | 77 | 11 | 2 | |
| | Other weeds | | | 13.45 | 2.86 | | | | | |
| | HCSEG/ EJCWCC | 19.04 | 149.35 | 5.12 | 0.35 | 35/52 | 128 | 57 | 3 | |
| | 10,000 YI/PCSC | 32 | 3420 | 1633 | est 0.31 | N/A | 200+ | 11 | 0 | |

| Agency | Watershed/ Waterway | River /Shore Miles | Acres Protected | Acres Treated | Solid Acres | Parcels Treated/ Survey | Total # of Permissioned Parcel | # Landowners Assisted | # New Agreements | Species/misc notes |
|---------------------------------|--|--------------------------|--------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------------|-----------------------------|------------------------|--|
| | Other weeds | | | | est 1.40 | | | | | |
| | QIN | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| Jefferson Co. Totals | 9 entities/10 waterways | >62.895 | >3642.6 | 1643 kw 13.45 othr | 1.269 kw 4.26 othr | >58 | >405 | >79 | 5 | |
| Mason County Waterways | | | | | | | | | | |
| HCSEG/ EJCWCC | Union River | 9.96 | 60.36 | 30.15 | 1.3 | 46/50 | 99 | 81 | 1 | |
| HCSEG/ EJCWCC | Tahuya River | 4.10 | 69 | 34.5 | .094 | 26/117 | 98 | 74 | 4 | |
| HCSEG/ EJCWCC | Dewatto River | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | |
| HCSEG/ EJCWCC | Liliwaup Creek | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | |
| MCNWCB | Allyn | 0.34 | 6 | 2 | 1.3 | 16/16 | 16 | 11 | 7 | knotweed spp. |
| MCNWCB | Finch Creek | 0.5 | 2.4 | 1.52 | 1.0 | 8/8 | 8/8 | 8 | 1 | knotweed spp. |
| MCNWCB | Sherwood Creek | 0.9 | 8 | 7 | 1.64 | 15 | 15/15 | 11 | 6 | knotweed spp. |
| MCD | Skokomish River | 3.5 | N/A | N/A | N/A | 24 | 24/24 | 20 | 2 | knotweed spp., others? unknown |
| MCNWCB/ DNR-PSC | Additional Misc riparian sites in Mason | 4.1 | 253.25 | 165.70 | N/A | 7/19 12/19 | 51/51 | 30 | 14 | knotweed spp., Multiple species including: yellow archangel, diffuse knapweed, reed canarygrass, tansy ragwort, fragrant waterlily, Scot's broom, everlasting peavine |
| KW Sub totals | MCNWCB | 1.74 | 16.4 | 10.52 | 3.94 | 39/39 | 39 | 30 | 14 | |
| | Other Weeds | 4.1 | 253.25 | 165.7 | N/A | 12/12 | 12 | 12 | N/A | |
| | HCSEG/ EJCWCC | 14.06 | 129.36 | 64.65 | 1.394 | 72/167 | 197 | 155 | 5 | |
| | MCD | 3.5 | N/A | N/A | N/A | 24/24 | 24 | 24 | N/A | |

| Agency | Watershed/ Waterway | River /Shore Miles | Acres Protected | Acres Treated | Solid Acres | Parcels Treated/ Survey | Total # of Permissioned Parcel | # Landowners Assisted | # New Agreements | Species/misc notes |
|--|--|-----------------------------|--------------------------------|------------------------------|------------------------|-------------------------------|--------------------------------------|-----------------------------|------------------------|--|
| Mason Co. Totals | 4 entities/8 waterways | <u>23.4 kw</u> 4.1 other | <u>145.76 kw</u> 253.25 oth | <u>75.17 kw</u> 165.7 oth | <u>5.334 kw</u> N/A | <u>135</u> 12/12 | <u>260</u> 12 | <u>205</u> 12 | <u>21</u> N/A | |
| Grays Harbor Waterways | | | | | | | | | | |
| QIN | Quinault River, Lake Quinault Lake, Prairie Creek, Joe Creek, associated tribs, the Queets and Clearwater Rivers | 44.5 | 2500 | N/A | N/A | N/A | N/A | N/A | | Statistics for these multiple watersheds has been merged. No further details are currently available. |
| Forterra/T NC | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Additional work in south Grays Harbor was not reported |
| Grays Harbor co. Totals | 2 plus entities/1 plus waterways | | | | | | | | | |

The information in the following table was generally provided by the agency represented. Some information had to be extrapolated to the best of our ability because no agency calculated information in exactly the same way, or provide all information. Definitions for each heading are provided as notes after the table. Partners were provided with a form and definitions to help standardize calculations. We received three forms from partners, others reported in a slightly different form, verbally, or presented some end of season information at the working group meeting.

AGENCY ACRONYMS USED IN TABLE:

- 10KI**-10,000 Years Institute
- CCNWCB**-Clallam County Noxious Weed Control Board
- DNR-PSC**-Clallam based Puget Sound Corps, Mason based Puget Sound Corps
- EJWCC**-East Jefferson Washington Conservation Corps
- GHNWCB**-Grays Harbor Noxious Weed Control Board
- HCSEG**-Hood Canal Salmon Enhancement Group
- LEK-WCC**-Lower Elwha Tribe based Washington Conservation Corps
- MCD**-Mason Conservation District
- MCNWCB**-Mason County Noxious Weed Control Board

NCEPMT-North Cascades Exotic Plant Management Team
ONP-WCC-Olympic National Park based Washington Conservation Corps
PCSC-Pacific Coast Salmon Coalition
QIN-Quinault Indian Nation
QNR-Quileute Indian Tribe-Natural Resources
TNC-The Nature Conservancy

TERM DEFINITIONS:

Agency: name of organization that performed the work-may not be the same agency that managed the project

Watershed/Waterway: Riparian area where treatments occurred. Some areas were combined if there was not detailed information broken out.

River/Shore miles: One mile of river-includes both banks, (**not** counted as separate miles like road shoulders). Estimated from track logs, measuring in GIS, or other information as available.

Area Protected: Ideally, length of river searched, times average width of the area actually searched. It is an indicator of the area that had to be canvassed while looking for knotweed that was interspersed. CCNWCB used a 50 foot width when there was no information to the contrary. When an entity reported only total acres of a parcel, we assumed a 50 foot width unless there was information to the contrary. Other entities calculated and reported this total differently.

Area Treated: This indicated the area of plants treated without lumping them together. Some entities included anything protected (surveyed), as treated area. Some only reported total parcel area, which may or may not have been surveyed or was only partially treated. Weed boards report treated area as the area encompassed (either estimated by paces, visual or GPS measured) by the farthest extent of the target species. If the infestation is distinctly patchy, the patches are instead summed up within a site and reported.

Solid Acres: Area of treated plants if they are all lumped together. WSDA has directed the Weed Boards to estimate this total based on the average calibrated gallons of mix/acre. For example, if backpack sprayers are calibrated to deliver 43 gallons/acre-this is approximately 1000 sq feet treated/gallon of mix. The formula would then be gallons of mix X 1000 sq feet/43,560 sq feet =solid acres. This was sometimes estimated from the rate and total gallons of herbicide used, and then plugged into the above formula assuming one gallon of mix equaled 1000 square feet treated.

Parcels Treated/Parcels Survey: This information was not uniformly supplied. The intent is to give a sense of how many parcels actually had plants to treat, how many had to be surveyed to find infestations. For weed boards it was calculated from number of distinct parcels where crew recorded GPS waypoints. GPS Track logs can provide a count of the number of parcels surveyed.

Total # of Permissioned Parcels-The total number of parcels encompassed by Land Owner Agreements within a project area. Gives a sense of how much area is involved and is connected to how many landowners had to participate.

Landowners Assisted: The number of landowners on whose land you actually worked during the season. Because permissions typically are given for four years, this number may differ from the total number of landowners from whom you have acquired permission. As knotweed projects mature or as time allows, crews may not go to every property for which they have permission.

Species Treated-For the most part, the projects in the table are knotweed focused. However, it is important to start showing the increasing complexity of projects that consider multiple species and the frequency with which they are now occurring around the Peninsula. Early infestations of additional invasives were sometimes treated in the course of treating knotweed. The Puget Sound Corps crews working under the auspices of Clallam and Mason County Weed Boards could be tasked with control of multiple species impacting riparian corridors either during the course of knotweed treatments or otherwise. **Please note** that Clallam County NWCB has only reported additional weed species work that was in the same vicinity or contiguous with knotweed projects. IN contrast, most Mason County NWCB projects utilizing the DNR funded PSC were recorded here, not just those in close proximity to knotweed projects because it was not always possible to break this information out.

Appendix I: Contact Information

This list encompasses agencies treating knotweed. Please see our website for past and present working group attendees and their contact information—www.clallam.net/weed

Clallam and Jefferson County

Cathy Lucero—Noxious Weed Control
Coordinator
360-417-2442
clucero@clallam.co.wa.us

Mason County

Pat Grover—Noxious Weed Control
Coordinator
360-427-9670 ext 592
PatriciaG@co.mason.wa.us

Grays Harbor County

Nancy Ness—Noxious Weed Control
Coordinator
360-482-2265
nancy.ness@wsu.edu

Mason Conservation District

Evan Bauder
360-427-9436 ext 13
evan@masoncd.org

Quileute Tribe

Garrett Rasmussen
360-374-2027
garrett.rasmussen@quileutenation.org

Makah Tribe

Rob McCoy
360-645-3058
rob.mccoy@makah.com

Lower Elwha Klallam Tribe

Mike McHenry
360-457-4012 ext 14
mike.mchenry@elwha.nsn.us

Jamestown S'Klallam Tribe

Hilton Turnbull
360-681-4603
hturnbull@jamestowntribe.org

Quinault Indian Nation

Caroline Martorano
360-276-8215
CMartorano@quinault.org

North Cascades Exotic Plant Management Team with the National Park Service

Dan Campbell
360-565-3076
dan_campbell@nps.gov

Olympic National Park
Joshua Chenoweth
360-565-3079
joshua_chenoweth@nps.gov

US Forest Service (Olympic Region)

Cheryl Bartlett
360-956-2283
cbartlett@fs.fed.us

10,000 Years Institute

Jill Silver
360-385-0715
jsilver@10000yearsinstitute.org

Hood Canal Coordinating Council

Luke Cherney
360-301-9565
lcherney@hccc.wa.gov

Hood Canal Salmon Enhancement Group

Michelle Myers
360-275-9722 ext. 22
michelle@pnwsalmoncenter.org

Forterra

Elsa Sargent
206.905.6954
esargent@forterra.org

North Olympic Salmon Coalition

Sarah Doyle
360 379-8051
sdoyle@nosc.org

Pacific Coast Salmon Coalition

Carl Chastain
360-374-8873
pacsac@olympen.com

Appendix II-WSDA Approved Report Form

2013 Puget Sound Corps Herbicide/Manual Treatment Data Form

Project ID #: (From project list.)

Project Complete? **Y** or **N** (add notes)

Name of Entity/Person for whom Treatment was applied:
Clallam County Noxious Weed Control Board

Street Address: 223 E 4th Street, Suite 15 City: Port Angeles State: WA Zip: 98362

Address or Exact Location of Site: (If you have the parcel number you do not need to enter the address.) Ex: Collins Campground
PIN(Parcel Identification Number): (Federal lands do not have parcel numbers, so you will have to enter the address or describe site locations.)

General Activity Fields

| County (circle one) | WRIA (circle one) | Project Name (from project list) | Owner (circle one) | Workforce** |
|-------------------------------|----------------------|----------------------------------|---|------------------------|
| Clallam Mason Jefferson | 14 15 16 17 18 19 | | Private Public Non-Profit (If you know) | Puget Sound Corps Crew |

Crew Members Present: (Who worked on the project that day?)

Site/Inventory Fields

| Start Date | Stop Date | Acres examined for weeds | Treatment Site (circle one) | | Total Manual Infested Area Treated: (DO NOT lump plants together) |
|---|-----------|---|-----------------------------|---|--|
| Use if on same site for multiple days. | | Approximate acreage of the area you surveyed. | Road edge/ROW Riparian | Forest Other | |
| | | | | | 2 ACRES |
| Weeds Treated (Just the PLANTS code is OK) | | Infested Area (DO NOT lump plants together) | | % of area examined for weeds infested with this species (lump plants together - use cover classes 1 - 9 listed below) | Manual/Herbicide or Survey |
| (List all the weeds you saw in this column. If you need more space use notes on back side.) | | (List approximate size of infestation.) acres | | (If the plants were all next to each other, what percentage of the infested area would they cover?) | (How did you treat this plant? Mark S if you only saw it.) |
| Tansy Ragwort/SEJA | | 1/4 acres | | 4 | H |
| Scotch Broom/CYSC | | 2 acres | | 6 | M |
| Himalayan Blackberry/RUDI | | 1 acres | | 9 | S |
| | | acres | | | |

* Cover Classes: 1 = Trace, 2 = 1 - 3%, 3 = 3 - 5%, 4 = 5 - 10%, 5 = 10 - 25%, 6 = 25 - 50%, 7 = 50 - 75%, 8 = 75 - 95%, 9 = 95 - 100%
Note: Cover classes are meant to be approximations only.

All Licensed Applicators: Name and License # Kate Bradshaw 12345, Scottie Mienke 12345

Firm Name: Washington State Department of Ecology Phone # Ask Jason

Firm Address: 300 Desmond Drive City: Lacey State: WA Zip: 98503-1274

| Application Date | Time Start | Time Stop | Temp (F) | Wind Speed (MPH) | Wind Direction | Cloud Cover | Remarks – Weather forecast |
|------------------|------------|-----------|----------|------------------|----------------|-------------|----------------------------|
| | | | | | | FS only | FS only. Is rain expected? |

| Application Area (acres) | Total Volume of Mix Applied (gal) | Dilutant | Special comment |
|--------------------------------|-----------------------------------|----------|-----------------|
| (Acres treated with herbicide) | (Generally 3x number of packs) | Water | |

| Product Name | EPA Registration # | Amount of herbicide used (oz) | Herbicide Applied/Acre or other measure | Concentration Applied |
|--------------|--------------------|-------------------------------|---|-----------------------|
| Aqua Neat | 228-365 | | | |
| Element 3A | 62719-37 | | | |
| Polaris | 228-534 | | | |
| Competitor | 2935-04001 | | | |
| Blazon | N/A | | | |

Was this application made as a result of a permit? **Yes No**
 If yes, Permit # Enter number for them

| WA State NPDES Acres: | Bankfull Acres: FS ONLY | Acres Treated within 150' of Water- FS ONLY |
|-----------------------|-------------------------|---|
| | | |

Notes: Application made as a result of a permit?: Washington state needs to know if this was an aquatic application. Did you get herbicide in a water system? Did you spray plants growing out of water? Were you standing in water when you sprayed? If yes, then circle yes, if no then circle no.

Bankfull Acres: Only a requirement for forest service land. How many acres did you spray that was within a riverbank? Some rivers are seasonal, if you spray in a dry riverbed, it will be a included in bankfull acres.

Acres treated within 150' of water: Again, FS only. Estimate the area within 150' of a water system. A mud puddle is not a water system.

Page 2

NARRATIVE (SUMMARY)

Example from this year:

Quileute Tribe— *“Due to limited time and funding we were only able to re-treat the Dickey and Bogachiel Rivers this year. The Dickey River was re-treated from the east/west for k down to the park boundary. Treatment on the Bogachiel River occurred between the HW 101 Bridge to approximately one mile up river of the HW 110 Bridge. Acres searched on the Bogachiel were calculated using GIS in off channel areas.*

Other information (fill in the blanks)

1. What was significant about this year’s work?

2. Any specific success story?

3. Any breakthrough treatment?

4. Progress made?

5. Recommendations for next year?

6. Is there a reveg or management plan in place?

7. What partners did you work with?

8. Where was your funding from?

9. Did you sponsor any educational events?

10. Please include contact information—contact person, address, phone number, email and website
