

*Snoqualmie/Skykomish  
Invasive Knotweed Control  
2008 Final Report*



*P*repared By

*Monica Walker  
November 20, 2008*

*King County Noxious Weed Control Program  
Water and Land Resources Division  
Department of Natural Resources and Parks  
201 S Jackson St, Suite 600  
Seattle, WA 98104  
206-296-0290*

*Prepared for the Washington State Department of Agriculture*



## **INTRODUCTION**

Knotweed control efforts, funded by Washington State Department of Agriculture (WSDA), were concentrated in the Snoqualmie/Skykomish Watershed (WRIA 7) which includes the Middle Fork Snoqualmie, South Fork Snoqualmie and South Fork Skykomish Rivers and their major tributaries. Each river has an established Cooperative Weed Management Area (CWMA) created in response to the impacts of “Japanese” or invasive knotweeds (*Polygonum cuspidatum*, *P. sachalinense*, *P. X bohemicum*).

Each CWMA develops a coordinated approach for controlling invasive knotweeds in the watershed. The CWMA’s goal is to restore or enhance the quality of the riparian habitat so that healthy ecosystem functions can return. This is achieved through eradication of invasive knotweeds from riparian ecosystems in the watershed and encouragement of subsequent re-vegetation activities. The knotweed species targeted in these CWMA’s are highly invasive plants that present an enormous challenge to land managers and restoration groups trying to remove them. Cooperation of all landowners is essential to a successful outcome and was a priority in planning this project.

Partners for the CWMA’s have been drawn from an extensive pool of diverse stakeholders, and more partners join as the projects develop and expand. Several partnerships with large landholders along the riparian corridors are of key importance to the success of the efforts. These projects bring together diverse groups of people working toward a common goal of improving riparian ecosystem health through knotweed control.

A significant proportion of weed control work funded by this grant was performed by Washington Conservation Corps (WCC) and EarthCorps crews (to stem inject invasive knotweed infestations) and Woodland Resource Services (to spot spray infestations).

Priority actions also funded included surveys to determine the extent of knotweed in the watershed, community education and outreach, follow-up treatment on sites previously treated and rapid response control by work crews and volunteers on identified high priority infestations.

## **PROJECT DESCRIPTION**

Each component of the project is described separately as follows:

### **Middle Fork Snoqualmie**

The Middle Fork Snoqualmie CWMA was established in early 2006 to begin a coordinated knotweed control project along the Middle Fork Snoqualmie River and its tributaries. The CWMA has received funding from the Washington State Department of Agriculture (WSDA) and the United States Department of Agriculture—Forest Service, Forest Health Protection Program (USDA-FS, FHP). The initial focus of this project was

to work in coordination with the surveys and control efforts already underway by Mountains to Sound Greenway Trust (MTSGT) staff, begin control of infestations where MTSGT activity left off, gather data through additional intensive surveys, and undertake rapid response control work on high priority infestations. Invasive knotweeds are less widely distributed on the Middle Fork Snoqualmie River than neighboring rivers and therefore the benefits from early detection and control are commensurately higher.

Major CWMA partners along the Middle Fork Snoqualmie River include: numerous private landowners, municipalities (e.g. King County Parks, King County Roads), state agencies (Washington State Department of Natural Resources, Washington State Department of Fish & Wildlife, Washington State Department of Transportation), Federal agencies (United States Forest Service), community-based conservation groups (Mountains to Sound Greenway Trust, Cascade Land Conservancy, Middle Fork Outdoor Recreation Coalition (MidFORC), American Whitewater, Washington Native Plant Society, EarthCorps, and Washington Conservation Corps (WCC)).

### **South Fork Snoqualmie**

The South Fork Snoqualmie CWMA was newly established in 2007 and began invasive knotweed control efforts in July and August 2007. Funding for the South Fork Snoqualmie Invasive Knotweed Control Project was provided by WSDA as an extension of the Middle Fork Snoqualmie project. King County Noxious Weed Control Program (KCNWCP) was initially contacted in 2006 by a private landowner along the river requesting training for landowners in The Cedar Village Homeowners Association. This landowner has continued to be very active in his community, rallying neighbors to volunteer in the knotweed control efforts. In addition, this landowner helped in our surveys along the river in early June 2007. The initial roadside survey, conducted in 2007, between RM 15.5 and RM 6.5, found the highest infestation at RM 13.5, at Olallie State Park.

Major partners along the South Fork Snoqualmie River include: numerous private landowners, municipalities (e.g. King County Parks, King County Roads), state agencies (Washington State Departments of Natural Resources, Fish & Wildlife, Transportation, Washington State Parks), King Conservation District, MTSGT, EarthCorps and WCC.

### **South Fork Skykomish**

The South Fork Skykomish CWMA was established in 2005. A primary goal of this Invasive Knotweed Control Project is to prevent the spread of invasive knotweeds from semi-populated areas into the Mt. Baker-Snoqualmie National Forest. In 2005 and 2006, the South Fork Skykomish CWMA received funding from the USDA Forest Service Mount Baker-Snoqualmie National Forest Resource Advisory Committees (RAC), to begin a coordinated knotweed control project in the watershed. WSDA provided funding for the South Fork Skykomish CWMA in 2007 and 2008.

This project, which built on data collected since 2003, established the distribution of invasive knotweeds in the Skykomish River Watershed and developed priorities for control/eradication with all possible stakeholders.

Major partners along the South Fork Skykomish River include: numerous private landowners, Burlington Northern Santa Fe Railway, municipalities (e.g. Town of Skykomish, King County Parks, King County Roads), state agencies (Washington State Department of Natural Resources, Washington State Department of Fish & Wildlife, Washington State Department of Transportation), Federal agencies (United States Forest Service, United States Fish and Wildlife Service), EarthCorps, and WCC.

## **PROJECT METHODS**

### Surveys

Data was collected using GPS equipment. Recorded data documented the knotweed species, growth stage of knotweed, area infested, percent cover of infestation, habitat type, proximity to riparian corridor, condition of knotweed, and UTM coordinates. Recommendations for treatment methods were also provided based on site conditions. An infestation or a site is defined as a parcel, or in the case of large publicly owned lands, distinct locations within a parcel separated by a barrier (road, stream), differences in land-use, or 0.5 mile distance. Within each site or infestation, there may be many discrete patches of knotweed which may change over time. The area of an infestation is defined either as the “gross area” referring to the total area of knotweed infested land or the “net area” which is the sum of the area of the individual knotweed patches.

### Knotweed Control Action Plan

Priority sites were identified from the surveys and scheduled for treatment. The preferred treatment method was determined for each site by evaluating site conditions (such as land-use, proximity to water), risk of herbicide exposure to the public, risk of collateral damage to native vegetation, and landowner preference. Control methods utilized an Integrated Pest Management (IPM) approach determined from the characteristics mentioned above. Knotweed stem injection with an aquatic formulation of glyphosate was selected as the primary treatment option for sites directly adjacent to riparian corridors and foliar applications of 1% aquatic imazapyr and 1% surfactant were chosen for sites that were injected in previous years.

### Outreach and Education

Once the priority control sites were identified, KCNWCP began contacting private landowners along the project rivers to seek their support and consent for knotweed treatment on their property. Forty-five private landowners on the Middle Fork Snoqualmie River, 225 private landowners in the South Fork Snoqualmie CWMA project area and 30 private landowners on the South Fork Skykomish, were initially contacted through mail about the knotweed project. The majority agreed with the goals of the

CWMA and responded favorably to KCNWCP's request for consent to have the knotweed on their properties controlled.

Sasha Shaw, King County Education Specialist, and Monica Walker, Project Manager, conducted a total of six education and outreach events for landowners, control crews and volunteers in the Snoqualmie/Skykomish watershed. The events included: a Middle Fork Snoqualmie Weed Watcher training and volunteer trails survey which was a joint effort between USDA-FS and KCNWCP, the Meadowbrook Farm Snoqualmie Knotweed and Invasive Weed Workshop, The Covington Knotweed and Invasive Weed Workshop, two WSU Forest Steward invasive weed trainings, a booth at the King County Fair, a booth at Issaquah Salmon Days and an upcoming Naturescaping workshop. In addition, two education and training days were held for WCC and EarthCorps crews as knotweed control efforts began. Web based outreach and education includes the Mid Fork Snoqualmie Invasive Weed Project web page, Knotweed Biology and Control Slideshow and a Knotweed Biology and Control Fact Sheet. A knotweed Best Management Practices (BMP) document was completed and a knotweed Do's and Don'ts fact sheet was created for park kiosks and landowner mailings.

#### Contractor Crew Training and Control Implementation

KCNWCP provided training for knotweed stem injection in July 2008 for contractor crews. Crew leaders were then responsible for any subsequent staff trainings and KCNWCP provided quality control and assurance as well as site orientation and logistics. The methodology for knotweed stem injection was to inject each cane between the lowest two nodes using a 3 ml dose of undiluted AquaNeat/AquaMaster (aquatic formulations of glyphosate) as directed by the herbicide label. The amount of herbicide injected directly into the knotweed canes was reduced from the 5 ml dose used in 2004 on other knotweed control projects, to 3 ml per cane.

This decision was based on research developed by Washington State University and The Nature Conservancy. After injection, each cane was marked with either degradable survey paint or a marking stick to help the applicator distinguish treated versus untreated canes. Stem injection is a labor-intensive control method but the low risk of drift, mobility into groundwater, or collateral damage encouraged our project to use it as the preferred method on sites directly adjacent to river corridors. In addition, there was one pesticide-sensitive landowner who chose the injection method because of the low risk of drift.



EarthCorps Crew

The grant funding provided by WSDA was primarily used for hiring contractors to perform the control work and the project manager's salary. EarthCorps and WCC crews were hired to perform the stem injection and Woodland Resource Services (WRS) was hired to spray invasive knotweed infestations. One National Pollutant Discharge Elimination System (NPDES) permit was acquired for the priority knotweed control areas in WRIA 7 to ensure compliance with Federal Clean Water Act requirements. All three rivers treated are covered under this NPDES permit.

## **PROJECT RESULTS**

KCNWCP, as the lead entity for the CWMA's, was responsible for developing the scope for the invasive knotweed control projects, conducting surveys, scheduling control efforts and conducting rapid response control activities on newly identified infestations.

As of September 30, 2008, \$44,575.44 of grant funds was spent on the Middle Fork/South Fork Snoqualmie and South Fork Skykomish Invasive Knotweed CWMA Projects of which \$42,740.00 was provided by WSDA and \$1,835.44 was provided by the USDA-FS, Forest Health Protection grant.

### **Middle Fork Snoqualmie**

#### *Summary of previous results*

Extensive surveys in the Middle Fork Snoqualmie watershed began in April 2006 to identify priority infestations for control. In late May 2006, KCNWCP, Mountains to Sound Greenway Trust, Cascade Land Conservancy, King County Parks, and a MidFORC volunteer met to discuss and plan invasive plant control on the Middle Fork Snoqualmie River. MTSGT staff knew of three infestations along roadsides in the upper watershed and those sites were on their agenda for control. KCNWCP assumed control responsibilities further downstream where private properties became more prevalent, and on lands outside the MTSGT project area. In June 2006, an intensive rafting survey revealed that the Middle Fork Snoqualmie River was free of knotweed upstream of the confluence of Roaring Creek at river mile 4.5. Roaring Creek was found to be significantly infested with knotweed for the first river mile.

During the 2006 control season, EarthCorps and WCC crews spent 18.5 days performing knotweed control work along the riparian corridor of Middle Fork Snoqualmie River and Roaring Creek. Crews were typically made up of six crew members, including the crew supervisor. Funding for control work on the Middle Fork Snoqualmie River was provided by WSDA and USDA-FS, FHP. In addition, MTSGT staff performed surveys and control of knotweed infestations in the upper watershed.

In June 2007, KCNWCP re-surveyed 11 contiguous miles of the Middle Fork Snoqualmie River (from river mile 11.5 to the 428<sup>th</sup> Avenue SE Bridge just upstream of the confluence of the Middle, North and South Forks of the Snoqualmie River) and 1 river mile of Roaring Creek. Surveys along the Middle Fork Snoqualmie River were conducted by roadside inspections and river rafting. Surveys conducted via river rafting

identified 50 priority knotweed infestations along the Middle Fork Snoqualmie River. Of those 50 priority sites, 43 were private property, 4 were King County owned parcels and 3 were Washington State owned parcels. Surveys along Roaring Creek, which were conducted in conjunction with control efforts, identified 15 priority sites. Thirteen are privately owned parcels and the remaining two are Washington State owned parcels.

EarthCorps crews spent 8 days stem injecting knotweed at Three Forks Park, located near the downstream end of the project area on the Middle Fork Snoqualmie River in 2007. WRS spent four days in August and September 2007 spot spraying knotweed infestations along five and a half river miles of the Middle Fork Snoqualmie River and Roaring Creek. Foliar applications consisted of 2% aquatic glyphosate, 1% aquatic imazapyr, and 1% surfactant.

During the 2006 control season, 10.8 net acres of invasive knotweed was treated within 27.47 gross infested acres. In 2007, 13.02 net acres of invasive knotweed was treated within 16.06 gross infested acres. The overall infested area was significantly reduced from 2006 levels by the stem injection treatment and because no new sites were found in 2007.

2008 Results

During the 2008 control season, The Middle Fork Snoqualmie CWMA, with funding from WSDA and USDA-FS, FHP, re-treated all knotweed infestations along the Middle Fork Snoqualmie River and Roaring Creek. WRS spent five and a half days, comprising 68.75 hours, spot spraying knotweed infestations along the Middle Fork Snoqualmie River. With the exception of Three Forks Park, the majority of treatment efforts in 2008 consisted of foliar spray applications, MTSGT provided three days of WCC crew time, which was spent stem injecting knotweed in Three Forks Park near RM 0.5.

Table 1 below summarizes the results of knotweed treatment along the Middle Fork Snoqualmie River and Roaring Creek by property owner, describing the gross infested area of knotweed treated.

<b>Table 1. Gross infested area Treated along the Middle Fork Snoqualmie River and Roaring Creek*, 2006-2008</b>			
<b>Ownership</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Washington State Lands	292,206 sq ft	87,727 sq ft	20,045 sq ft
King County Lands	264,471 sq ft	424,342 sq ft	210,620 sq ft
Privately Owned Lands	640,907 sq ft	192,625 sq ft	46,610 sq ft
<b>Total in Sq Ft</b>	<b>1,197,584 sq ft</b>	<b>699,694 sq ft</b>	<b>277,275 sq ft</b>
<b>Total in Acreage</b>	<b>27.47 acres</b>	<b>16.06 acres</b>	<b>6.37 acres</b>

*\*Locations treated occur within Middle Fork Snoqualmie riparian zone or adjacent to streams which hydrologically connect to the Middle Fork Snoqualmie River*

Gross Knotweed Area Infested: Aggregate of infested sites selected for treatment in landscape

Further reductions in infested area in the project area were noted in 2008. Fifteen parcels treated in 2006 and 2007 showed no knotweed re-growth in 2008. A total reduction in

the overall infested footprint by 77% has been achieved along the Middle Fork Snoqualmie River to-date. This reduction includes treatment of a new infestation just downstream of 2007's project area at RM 0.25. During the 2008 treatment season, 2.00 net acres of invasive knotweed was treated within 6.37 gross infested acres.

The initial goals of the project were overwhelmingly met in terms of surveys, education and outreach, planning and coordination, and selecting and treating each high priority site along the Middle Fork Snoqualmie River and Roaring Creek.

## **South Fork Snoqualmie**

### Summary of previous results

Initial surveys along the South Fork Snoqualmie River began in spring 2007 and consisted exclusively of roadside surveys and spot inspections along nine non-contiguous river miles between RM 15.5 and 6.5. The first infestation of knotweed was found at RM 13.5, in Olallie State Park. Control efforts on the South Fork Snoqualmie River began in late July 2007.

EarthCorps crews began control efforts in 2007 at RM 13.5 and worked downstream to RM 12.25. Stem injection was the only method used on the South Fork Snoqualmie River during the 2007 control season. In total, 4.5 net acres of knotweed was controlled within 6.58 gross infested acres along one river mile on the South Fork Snoqualmie River. All work was funded through a WSDA grant and was conducted at Olallie State Park. EarthCorps crews spent a total of 5 days controlling knotweed at Olallie State Park.

In addition to the 2007 control work by EarthCorps, private property owners from the Cedar Village Homeowners Association began controlling knotweed in 2006 along their river banks, and control continued into 2007. As of September 2007, they have controlled approximately half a river mile of the South Fork Snoqualmie River between RM 6.5 and RM 7.

### 2008 Results

In 2008, an intensive rafting survey was conducted between RM 9.5 and 7.25 which found that the majority of the riparian area below Twin Falls State Park, located at RM 9.5, is heavily infested with invasive knotweed.

During the 2008 treatment season, EarthCorps and WCC crews stem injected infestations along the South Fork Snoqualmie River between RM 13 and RM 11. Control crews spent a total of 13 days, comprising approximately 704 hours stem injecting knotweed infestations along the two river miles. In addition, WRS and KCNWCP staff sprayed infestations treated in 2007 and infestations too small for 2008 injection. WRS spent 5.25 hours and KCNWCP staff spent 43 hours spraying infestations along the South Fork Snoqualmie River. KCNWCP assisted the Cedar Village Homeowners Association in

2008 by spot spraying along one half river mile where the Association injected knotweed in 2006 and 2007.

Table 2 below summarizes the results of knotweed treatment along the South Fork Snoqualmie River by property owner, describing the gross infested area of knotweed treated.

<b>Table 2. Gross infested area Treated along the South Fork Snoqualmie River* 2007-2008</b>		
<b>Ownership</b>	<b>2007</b>	<b>2008</b>
Washington State Lands	286,622 sq ft	886,815 sq ft
King County Lands	0	0
Privately Owned Lands	0	43,440
<b>Total in Sq Ft</b>	<b>286,622 sq ft</b>	<b>930,255 sq ft</b>
<b>Total in Acreage</b>	<b>6.58 acres</b>	<b>20.35 acres</b>

*\*Locations treated occur within South Fork Snoqualmie riparian zone or adjacent to streams which hydrologically connect to the South Fork Snoqualmie River*

Gross Knotweed Area Infested: Aggregate of infested sites selected for treatment in landscape

A more thorough survey on the South Fork Snoqualmie River, upstream of RM 13.5, is recommended for 2009 to fully determine the extent of knotweed along the riparian area and to establish the reaches free of knotweed.

### **South Fork Skykomish**

#### Summary of previous results

KCNWCP completed surveying 21 non-contiguous miles of the mainstem riparian corridor of the South Fork Skykomish and Tye Rivers in 2005. Surveys began at the east entrance of Iron Goat Trail and extended downstream past the Index Creek confluence (River Mile 28 to 7.5). Surveys on the Tye, Foss and South Fork Skykomish Rivers were conducted by roadside inspections, streamwalking and river rafting. An intensive river rafting survey was conducted on the South Fork Skykomish River from the Beckler River confluence to half a mile downstream of the Index Creek confluence (RM 17 to 7.5). In addition, extensive surveys along Highway 2, Iron Goat Trail, and NE Old Stevens Pass Highway were conducted.

Thirteen days, comprising 770 hours (includes driving time from Seattle), were provided by EarthCorps and WCC for knotweed control. In addition, KCNWCP personnel spent 304 hours surveying for invasive knotweed infestations and coordinating control work between May and September 2005. In total, 9.3 net acres of invasive knotweed was treated in 2005 within 21.2 gross infested acres.

In 2006, KCNWCP re-surveyed 15 non-contiguous miles of the mainstem riparian corridor of the South Fork Skykomish and Tye Rivers.

Six days, comprised of 288 man hours, were provided by WCC and EarthCorps crews for knotweed control. This number is down from time spent in 2005 due to decreased funding in 2006. WCC crews camped at the Beckler River Campground four nights to reduce driving time from Seattle, allowing for more on-the-ground control. KCNWCP personnel spent 140 hours between May and September 2006 surveying for invasive knotweed infestations and coordinating control work.

In total, 2.42 net acres of invasive knotweed was treated in 2006 within 21.2 gross infested acres. Two private property owners adjacent to the South Fork Skykomish River began controlling invasive knotweed infestations on their properties in 2006. KCNWCP donated an injection gun to these property owners to assist them in their control efforts.

Funding for the South Fork Skykomish CWMA in 2005 and 2006 was provided by the USDA Forest Service Mount Baker-Snoqualmie National Forest Resource Advisory Committees (RAC). In 2007, WSDA began funding the control efforts on the South Fork Skykomish and Tye Rivers.

A roadside survey in early June 2007 discovered new infestations just upstream of previously treated areas. The majority of the new infestations, located in the scenic neighborhood between RM 28 and RM 29, were treated in 2007. Further surveys were conducted in conjunction with foliar herbicide applications performed by WRS, KCNWCP's spray contractor. Infestations that had been stem injected in previous years control efforts were spot sprayed in 2007 with aquatic glyphosate. In total, 47 sites were identified as priority sites along the Tye and South Fork Skykomish Rivers. Of those 47 sites, 39 were treated during the 2007 season.

In all, approximately 7.5 river miles were treated on the South Fork Skykomish and Tye Rivers in 2007. In 2007, 30 private landowners, owning 36 parcels, were notified of the CWMA knotweed project. Of those 30 landowners, 22 responded favorably and 8 did not respond at all. In addition, knotweed control efforts were conducted on 11 public parcels owned by Washington State and US Forest Service. During the 2007 control season, 4.17 net acres were treated within 15.77 gross infested acres.

### 2008 Results

In late August 2008, EarthCorps and WCC crews spent nine days stem injecting knotweed along the riparian corridor of South Fork Skykomish and Tye Rivers. Both crews camped at the Beckler River Campground for the week, saving approximately 28 hours in drive time and allowing for more on-the-ground control. WRS spot sprayed previously injected sites on September 10<sup>th</sup> and 11<sup>th</sup>, 2008. WRS spent approximately 16.5 hours spraying knotweed sites in the project area. In addition, Burlington Northern Santa Fe Railroad sprayed infestations on their right-of-way, adjacent to sites treated in 2007 and 2008.

Table 3 below summarizes the results of knotweed treatment along the South Fork Skykomish River by property owner, describing the gross infested area of knotweed treated.

<b>Table 3. Gross infested area Treated along the South Fork Skykomish and Tye Rivers*, 2005-2008</b>				
<b>Ownership</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
USDA-FS Lands	391,440	321,986	60,530	637,427
Washington State Lands	337,025	242,082	184,380	103,570
Town of Skykomish	25,000	0	0	0
Privately Owned Lands	170,000	144,140	442,204	598,758
<b>Total in Sq Ft</b>	<b>923,465</b>	<b>708,208</b>	<b>687,114</b>	<b>1,339,755</b>
<b>Total in Acreage</b>	<b>21.2</b>	<b>16.26</b>	<b>15.77</b>	<b>30.76</b>

*\*Locations treated occur within South Fork Skykomish riparian zone or adjacent to streams which hydrologically connect to the South Fork Snoqualmie River*

Gross Knotweed Area Infested: Aggregate of infested sites selected for treatment in landscape



South Fork Skykomish, before Treatment 2005

South Fork Skykomish after treatment 2005



South Fork Skykomish June 2007



South Fork Skykomish, September 2008



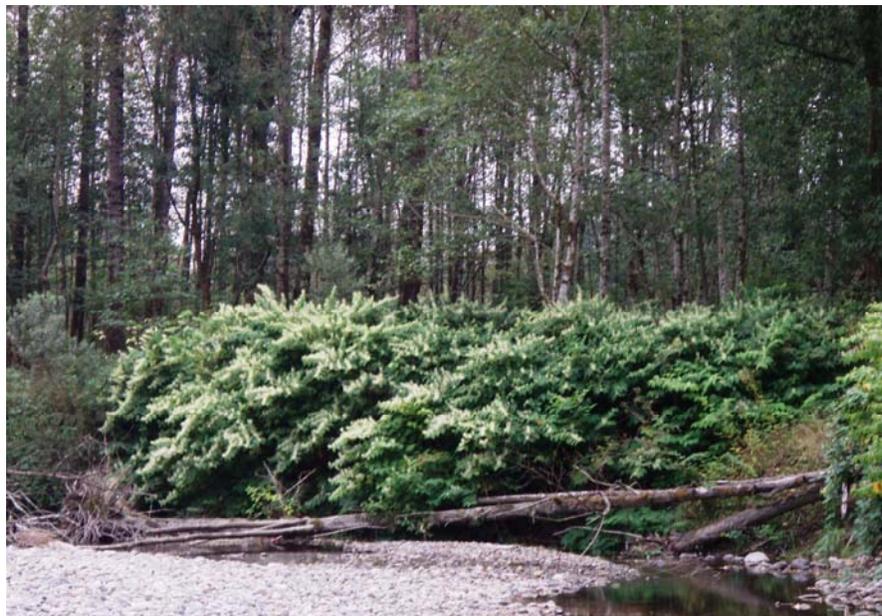
## DISCUSSION

Coordination of control efforts varied greatly on each river. The South Fork Skykomish is predominately made up of large publicly-owned lands so coordination was relatively simple. Coordination of control efforts was more complicated on the Middle Fork Snoqualmie River due to the large number of private properties infested with knotweed. Although the landowners were excited about this project, each wanted to be notified a day or two before we were expected to be on site. It was not always possible to determine when control crews would get to a site, making coordination more difficult at times. However, no significant problems arose during the course of the projects which resulted in either a change of objectives or timelines.

2008 saw for the first time collaborative restoration efforts with MTSGT on the Middle Fork Snoqualmie River CWMA to re-vegetate knotweed control sites. During the winter of 2008-2009, MTSGT will be planting previously treated, key sites along the Middle Fork Snoqualmie River. Between 8,000-10,000 willow stakes will be planted in the project area. Changes for the South Fork Snoqualmie River project will include a more intensive rafting/kayaking survey to fully determine the extent of the knotweed along the riparian corridor upstream of Olallie State Park. Minimal changes to The South Fork Skykomish River project are expected. Education and outreach will continue to expand throughout the watershed and KCNWCP will notify all landowners infested with knotweed about the projects. Treatment of new sites, monitoring and maintenance of sites treated in past years and treating consecutive river miles will be the focus in 2009.

In 2009, for all project areas discussed in this report, more time needs to be allocated to spot spraying all previously treated infestations. The treatments to date have left infestations that are small and dispersed. Location of these sites by GPS and spot spraying is likely to be the most cost effective follow-up treatment approach for previously treated sites.

Middle Fork Snoqualmie Three Forks Island before treatment, 2006



Middle Fork Snoqualmie Three Forks Island after injection, 2006



Middle Fork Snoqualmie Three Forks Island, June 2007



## Middle Fork Snoqualmie, Three Forks Park Island September 2008



## CONCLUSION

The 2008 Middle Fork/South Fork Snoqualmie CWMA and South Fork Skykomish CWMA Invasive Knotweed Control Projects achieved an incredibly successful season and all priority activities outlined in this project's scope were accomplished. The 2008 season began with initial surveys to determine re-treatment needs on the Middle Fork Snoqualmie and South Fork Skykomish Rivers, and establish a baseline of knotweed infestations on the South Fork Snoqualmie River. Once funding was secured, KCNWCP conducted more intensive surveys to determine the full extent of the knotweed in the project areas, offered education and outreach opportunities to the public, and began project planning and scheduling with crews and landowners. These projects will continue to provide substantial long-term environmental benefits to the riparian ecosystems.

To be effective over time, these projects need to continue as a long term strategic knotweed control program. A significant outcome of the project has been the development of the capacity of the CWMA's to implement this long-term strategy. Future priorities for the project include monitoring and follow-up of sites treated in 2008, rapid-response control of newly identified infestations, and continued public outreach. With additional funding, the CWMA's can implement this strategy successfully.

The WSDA funding provided for this project has also provided valuable experience and insight which has greatly benefited the implementation of four other watershed-scale knotweed control projects in King County. Two of these projects are being directly implemented by KCNWCP and two by other organizations assisted by KCNWCP. These additional projects are located on Issaquah Creek and the Green, Cedar and Raging Rivers.