

# **Controlling Invasive Weeds in the Clackamas River Basin**

## **A Progress Report of work conducted on the Clackamas River Riparian Restoration Project during the 2006 Field Season**

### **Overview and Project Summary**

The Clackamas River Riparian Restoration Project, with a focus on the Class B Noxious Weed Japanese knotweed (*Polygonum cuspidatum*), has successfully completed its fifth field season. This partnership between the Oregon Watershed Enhancement Board (OWEB), Metro, the Clackamas River Basin Council (CRBC), and hundreds of river and streamside landowners, has contributed toward the mapping and progressive control of Japanese knotweed in the lower Clackamas River Basin.

Metro owns approximately 1,000 acres of open space in the Clackamas River Basin. In the late 1990's, Metro's Natural Resources Scientist observed expanding infestations of Japanese knotweed on several of its Clackamas County properties. In response, Metro initiated a program to begin mapping and controlling Japanese knotweed in the Clackamas River Basin, sharing a field crew with the Nature Conservancy, which was doing the same in the Sandy River Basin. In the years that followed, Metro worked to develop capacity within the CRBC as a partner on this project, recognizing the need to expand the effort to the Clackamas tributaries and maintain an ongoing effort of mapping and long-term control. The CRBC assumed the primary leadership role for the field work in this project in 2005, and continued that role in 2006 with the help of three AmeriCorps volunteers.

Along the mainstem of the Clackamas, knotweed has been treated from River Mill Dam downstream to the mouth of Deep Creek. This year also involved re-treatment of Eagle, Wade, Delph, Dubois, and Clear Creeks, as well as the north fork and mainstem of Deep Creek. The urban watersheds of Rock, Richardson, Sieben, and Noyer Creeks were added to the survey this year. All of the known knotweed along Richardson, Sieben and Noyer Creeks were treated in 2006 and treatment has been initiated on Rock Creek. Ongoing monitoring and further treatment of this aggressive weed is paramount in continuing our progress of removing this weed from the Clackamas River Basin.

### **2006 Goals**

The Clackamas River Basin Council will do the following:

- 1.) Refine the occurrence map for Japanese knotweed within the Clackamas River Basin indicating the frequency of treatment.
- 2.) Conduct follow up or initiate new treatment to all known Japanese knotweed sites along the mainstem Clackamas River, Eagle, Bear, Delph, Dubious, mainstem of Deep, North Fork of Deep, Tickle, Wade, and Clear Creeks.
- 3.) Conduct a location assessment for Purple Loosestrife, Butterfly Bush, and False-Brome in the urban tributaries of Noyer, Richardson, Rock, and Sieben Creeks as well as the mainstem Clackamas River.
- 4.) Complete first year treatment of Japanese knotweed on all known sites on Sieben, Richardson, and Noyer Creeks.
- 5.) Initiate treatment of Japanese knotweed on Rock Creek.

- 6.) Treat false-brome at controlled sites located at Milo McIver State Park on the Clackamas River and isolated sites throughout the basin.
- 7.) Initiate controlled experiments and begin studying the distribution methods of false-brome.
- 8.) Inform the public regarding noxious weeds and their impact to watersheds through community outreach events and workshops.

### **Study Area**

Figures 1-3 illustrates the watershed boundary and the major tributaries within the sub-basins, distribution of private and public lands, and Japanese knotweed treatment schedule, respectively, as it has been characterized by winter 2006. Figure 4 shows the location of surveyed streams in 2006. Figure 5 shows the area of Milo McIver State Park where false-brome controlled experiments, monitoring, and treatment has been established. Figure 6 shows the location of purple loosestrife, butterfly bush, and false-brome detected throughout the basin in 2006. Table 1 specifies the amount of treated Japanese knotweed along each portion of the Clackamas River and its tributaries.

### Headwaters

As is portrayed in Figure 2, the upper portions of the Clackamas River Basin are largely owned by the United States Forest Service (USFS) and the Bureau of Land Management (BLM). Metro conducted a number of surveys in selected areas of the USFS-owned headwater region in 2003. Metro also coordinated with the USFS (primary contact: Carol Horvath) to determine the level of assessment the Service has undertaken, and to share knotweed occurrences mapped and characterized by Metro.

### Mainstem

The Clackamas River Basin Council extended the Japanese knotweed mainstem study area to encompass an area bound on the upstream extent by the federally-owned land in the headwaters (essentially the upstream limit to the area flooded by the North Fork Dam), and bound on the downstream end by the river's confluence with Deep Creek, this to include everything within the 100-year flood regime. Work conducted on this portion of the mainstem consisted of follow-up maintenance to all existing sites that have been mapped and treated the last four field seasons.

In 2005, the CRBC slightly changed the structure of the monitoring standards set forth by Metro to adjust to the plant's dynamic distribution. Individual microsites were lumped into larger macrosites that were delineated by geomorphic features within the river system, i.e., floodplains, islands, and back channels.

This season a survey was conducted to identify Japanese knotweed, within the target area, from Deep Creek to the confluence of the Willamette River. A few new patches were located within our target area, which were documented and mapped.

### Tributaries

Downstream of River Mill Dam there are nine sub-basins that drain into the Clackamas River. In order, moving downstream from the headwaters, are Lingelbeck, Eagle, Goose, Deep (including Tickle and Noyer Creeks), Foster, Richardson, Rock, Clear, and Sieben Creek sub-basins. Previous seasons have used this approach for mapping the upper tributaries. In 2006 urban tributaries were added, and community outreach is crucial since urbanization has disturbed natural areas.

In 2006, the CRBC conducted follow up treatments to all previously mapped sites along Eagle, Deep, Dubois, Wade, Delph, Bear, and Clear Creeks. In addition, the CRBC embarked on a survey and assessment of invasive weeds, including purple loosestrife, butterfly bush, and false-brome, along the urban watersheds of Noyer, Richardson, Rock, and Sieben Creeks. The surveys for these creeks may be seen in Figure 7. Treatment was found to be unnecessary at this time for Noyer Creek, although, treatment began on Richardson, Rock and Sieben Creeks.

### **2006 Treatment Methods for Japanese knotweed**

During 2006, the CRBC treated seventeen sites along the mainstem and forty sites along all of the tributaries. The total number of stems treated is estimated at 23,850 stems (Table 1).

The CRBC used three forms of treatment to kill knotweed: 1) stem-injected herbicide, 2) foliar spray of herbicide, and 3) a combination of both. Only the glyphosate-based herbicide Rodeo was used during 2006. Stem-injected herbicide was applied at an undiluted strength in doses of 3 ml per stem of knotweed. Foliar applications of herbicide were used to treat stems that were too narrow for stem-injection (stems smaller than ~1 cm were too brittle for stem injection). Foliar-applications consisted of a 5 - 7% solution of herbicide augmented with 1% surfactant (Agri-Dex or L I-700) and a tracer dye. All treatments were conducted by certified personnel. (AmeriCorps volunteers must receive an Oregon Department of Agriculture Commercial Pesticide Applicators License prior to applying herbicide.)

A new method of monitoring treated sites began in 2006. Previously, sites had been identified as either having or not having Japanese knotweed. A new system of color-coded marking points will indicate where treatment has been initiated (no previous treatment), where treatment has occurred for 1 to 2 years (monitoring is still necessary to ensure the plant does not rebound), and where treatment has occurred for 2 or more years (the site visit is less frequent, but monitoring is needed for long term planning). Figure 3 demonstrates this new monitoring system using a red, yellow, green scale.

### **Stem Injection**

The research performed on Japanese knotweed to determine the best use of injection and foliar spray was pioneered by the Clark County Weed Management Department (Director Phil Burgess) and further evaluated during the 2003 field season by Metro and The Nature Conservancy (TNC). The studies of these organizations helped the CRBC to see a large proportion of reduction from 2003 to 2004. While new studies are still being conducted, this method still results in the most efficient level of knotweed control.

In 2005, the CRBC and The Nature Conservancy (TNC) continued to partner to evaluate the dose response of Japanese knotweed stem-injection initiated in 2003. Based on 60 knotweed patches with 5 different treatment categories (control, 1.5ml, 3ml, 5ml, and 5ml + foliar spray), no evidence distinguished higher doses to be more effective. In 2006, a dosage of 3 ml was used for stem injection treatment of Japanese knotweed.

### **Japanese Knotweed Working Group Meeting Minutes**

In 2006, the field crew was able to attend a meeting put on by TNC focusing on Japanese knotweed. Watershed councils from Oregon and Southwest Washington were

represented to discuss successful treatment methods, funding issues, and possible directions for future treatment.

Also discussed at the meeting were other types of herbicide and their effectiveness. Most people have observed that Rodeo is effective at knocking out about 90% of the Japanese knotweed at sites. However, it does not seem to be able to eradicate the weed completely. Imazyapyr (Habitat™ is the aquatic version used for riparian area treatment) was mentioned as having some success at eradication, as was a mixture of glyphosate and Habitat. As of yet, there is no evidence that either of these is significantly better than Rodeo.

### **2006 Treatment of False-Brome**

Milo McIver State Park is located just downstream of River Mill Dam on the mainstem of the Clackamas River. Treatment has been started just below the dam extending downstream through Reach 1 and partially into Reach 2, both of which are still within the State Park boundary.

Re-seeding of native seeds is suggested sometime after herbicide application. Also, a spring de-heading and trash disposal is suggested to reduce the number of herbicide treatment needed. This is the best suggested regiment; however it is labor intense and will not be feasible in all cases. It is ideal for areas of large-cultures of false-brome that are fairly easily accessed and located.

In October 2006 treatment of false-brome along the river was completed in Reach 1 and begun in Reach 2. Treatment was limited to the first river terrace due to time and weather constraints. Reach 1 had several large patches of false-brome and many smaller groups. The amount of false-brome in Reach 2 gradually increased downstream to areas that were large (40 ft<sup>2</sup>) monoculture patches.

## **APPENDICIES**

**Figure 1. Map showing the major tributaries and Sub-Basin watersheds.**

**Figure 2. Map showing the land ownership throughout the entire Basin.**

**Figure 3. Map showing Japanese knotweed occurrence throughout the basin as of fall 2005.**

**Figure 4. Map showing miles of streams surveyed in the Clackamas River Basin.**

**Figure 5. Map showing location of False-Brome treatment sites at Milo McIver State Park.**

**Figure 6. Map showing the location of Purple Loosestrife, Butterfly Bush, and False-Brome surveyed throughout the Clackamas River Basin.**

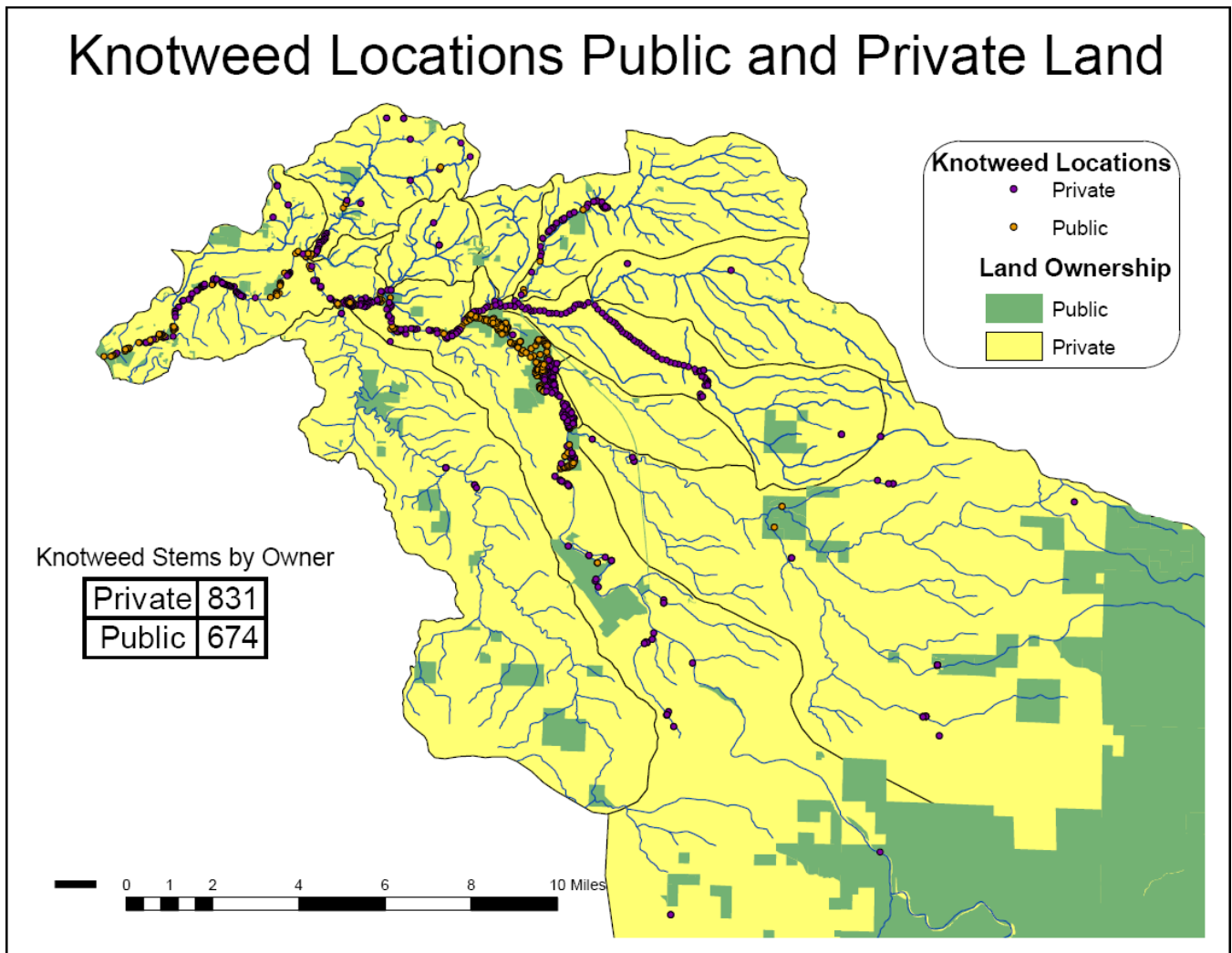
**Figure 7. Map showing the distribution of Purple Loosestrife, Butterfly Bush, and False-Brome surveyed in the Urban Watersheds of Noyer, Richardson, Rock, and Sieben Creek Watersheds.**

**Table 1. Table showing the total treatment of Japanese knotweed for the 2006 field season.**

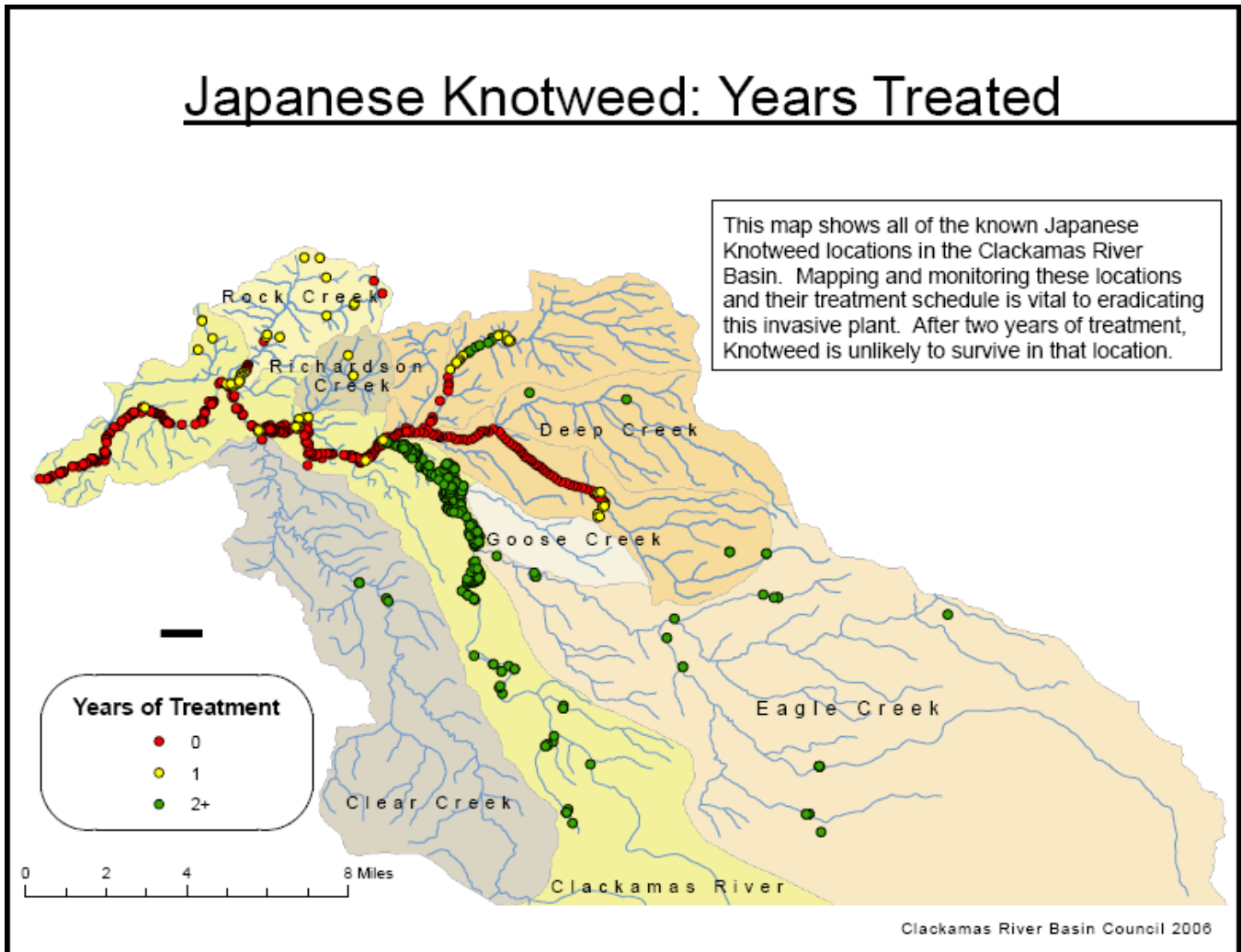
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**Figure 2. Map showing the land ownership throughout the entire Basin.**

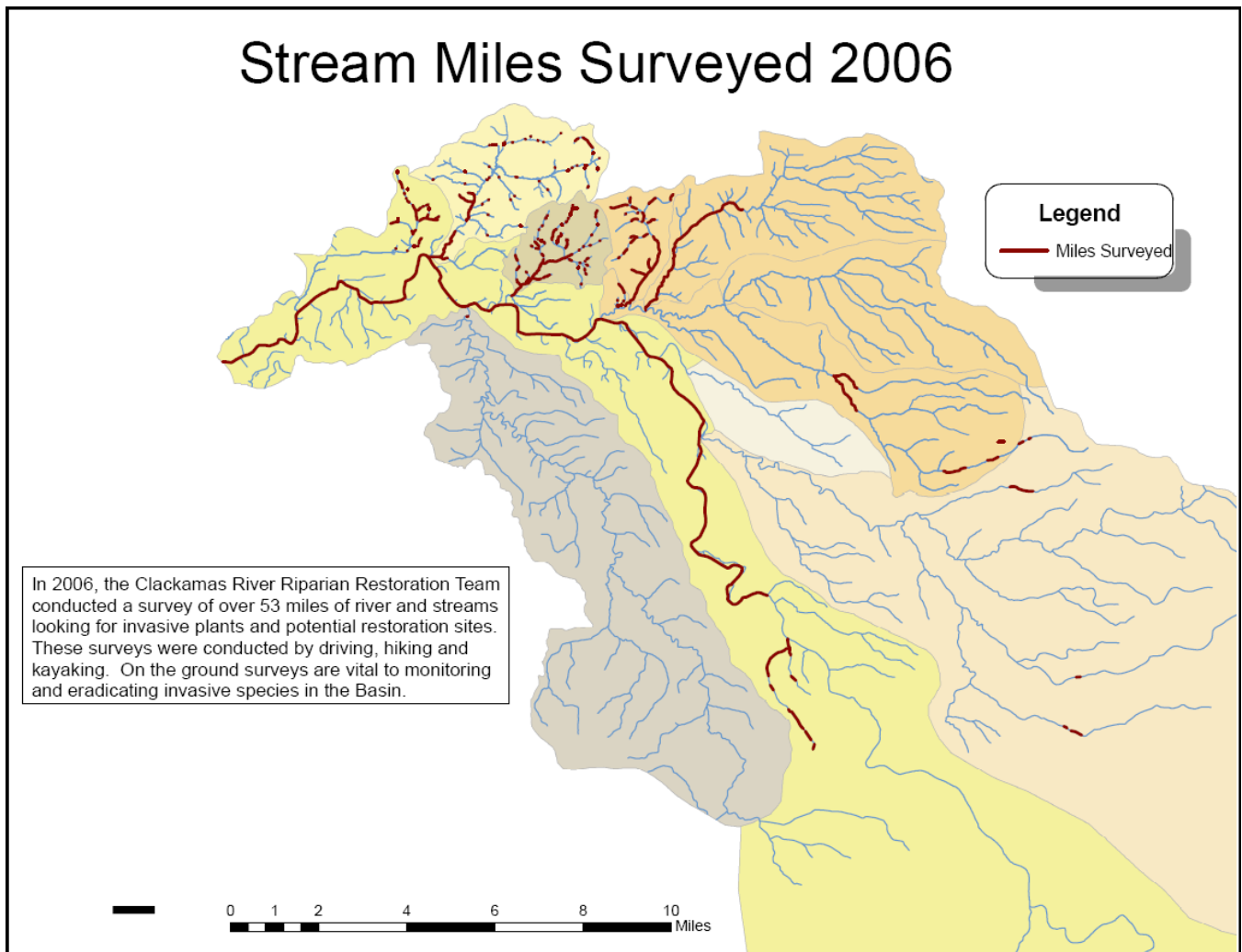


**Figure 3. Map showing Japanese knotweed occurrence throughout the basin as of fall 2006. Note:** In 2005, the CRBC changed the structure of the monitoring standards set forth by Metro to adjust to the plant's dynamic distribution. Individual microsites were lumped into larger macrosites that were delineated by geomorphic features within the river system, i.e., floodplains, islands, and back channels.

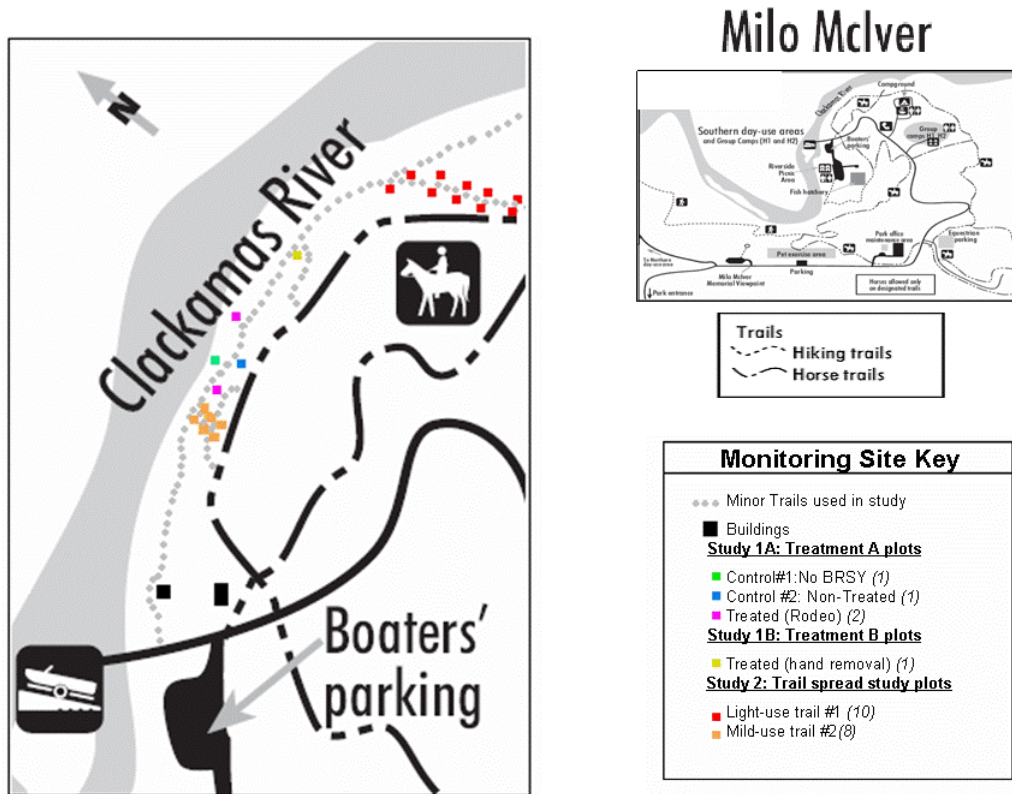




**Figure 4. Map showing miles of streams surveyed in the Clackamas River Basin.**

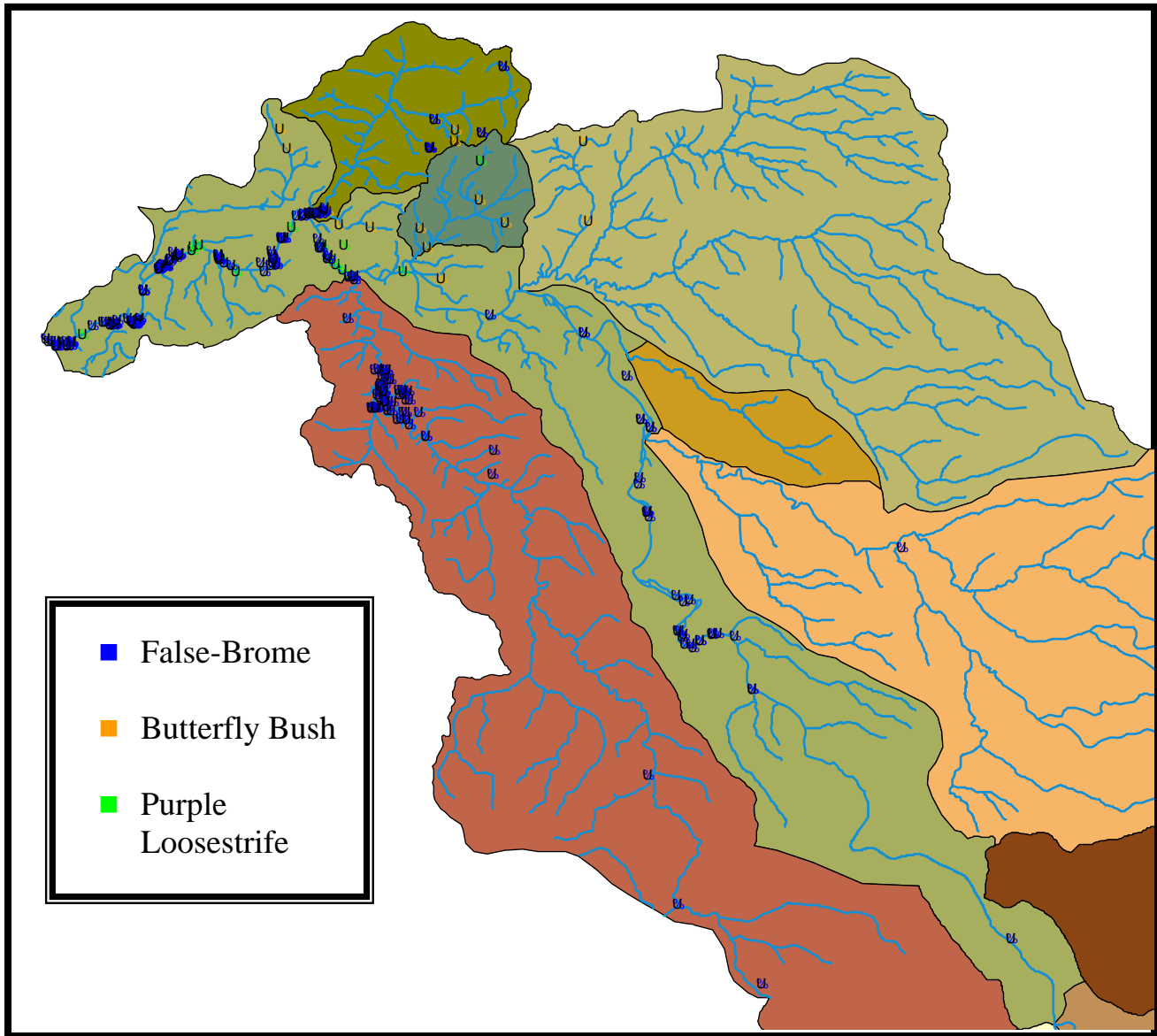


**Figure 5. Map showing location of false-brome treatment sites at Milo McIver State Park.**



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**Figure 6. Map showing the location of Purple Loosestrife, Butterfly Bush, and False-Brome surveyed throughout the Clackamas River Basin.**



**Table 1. Table showing the total treatment of Japanese knotweed for the 2006 field season.**

<b>Reach</b>	<b>Number of Stems Injected</b>	<b>Gallons Sprayed</b>	<b>Number of Stems Sprayed*</b>	<b>Total Stems Treated</b>
Reach 1	0	0	0	0
Reach 2	0	0.1	25	25
Reach 3	0	0	0	0
Reach 4	0	0.1	25	25
Reach 5	0	0	0	0
Reach 6	0	0	0	0
Reach 7	0	0	0	0
Reach 8	0	0	0	0
Reach 9	0	1	250	250
Reach 10	657	1.5	375	1,032
Reach 11	28	2.75	687	715
Reach 12	0	0.25	62	62
Reach 13	10	0.5	125	135
Reach 14	53	2.2	550	603
Reach 15	248	2.5	625	873
Reach 16	0	1.2	300	300
Reach 17	0	0	0	0
Reach 18	0	0	0	0
Reach 19	0	0	0	0
Reach 20	0	0.25	62	62
Reach 21	0	0	0	0
Reach 22	206	0	0	206
Reach 23	298	0	0	298
<b>Mainstem Total</b>	<b>1,500</b>	<b>12.35</b>	<b>3,087</b>	<b>4,587</b>
Clear Creek	867	0.6	150	1,017
Deep Creek	4,234	4.15	1,037	5,271
Delph Creek	28	0.5	125	153
Dubois Creek	487	0.9	225	712
Eagle Creek	8	0.5	125	133
North Fork Deep Creek	863	1.75	437	1,300
Richardson Creek	1,014	5.2	1,300	2,314
Rock Creek	1,589	3.35	837	2,426
Sieben Creek	77	0.6	150	227
Tickle Creek	12	0.35	87.5	99.5
Wade Creek	0	0.25	62.5	62.5
Whiskey Creek	833	0.5	125	958
<b>Grand Totals</b>	<b>13,012</b>	<b>43.35</b>	<b>10,837</b>	<b>23,849</b>