

Port of Seattle Watershed Restoration Grant November 2008 Final Report

Miller and Walker Creek Noxious Weed Survey and Removal Project

King County Noxious Weed Control Program
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Current Project Completion

100%

2008 Data

Weed Name	Total number of parcels Surveyed 2008	parcels where weeds were found	SQ ft of weeds present	sq ft of weeds controlled	percentage of weeds controlled
Policeman's Helmet	203	22	3,955	3,955	100%
Giant Hogweed	203	9	127	127	100%
Purple loosestrife	203	10	20,565	20,565	100%
Invasive Knotweeds	203	60	19,358	18,858	97%
Totals	203	101	44,005	43,505	99%

2007 Data

Weed Name	Total number of parcels Surveyed 2007	parcels where weeds were found	SQ ft of weeds present	sq ft of weeds controlled	percentage of weeds controlled
Policeman's Helmet	217	38	23,068	22,568	98%
Giant Hogweed	217	6	130	130	100%
Purple loosestrife	217	14	16,855	16,855	100%
Invasive Knotweeds	217	60	54,968	53,191	97%
Totals	217	118	95,021	92,744	99%

2006 Data

Weed Name	Total number of parcels Surveyed 2006	parcels where weeds were found	SQ ft of weeds present	sq ft of weeds controlled	percentage of weeds controlled
Policeman's Helmet	143	37	27,051	20,919	77%
Giant Hogweed	143	9	444	444	100%
Purple loosestrife	143	24	14,617	14402	99%
Invasive Knotweeds	143	28	19,221	18710	97%
Totals	143	98	61,333	54,475	93%

2005 Data (prior to grant)

Weed Name	Total number of parcels Surveyed 2005	parcels where weeds were found	SQ ft of weeds present	sq ft of weeds controlled	percentage of weeds controlled
Policeman's Helmet	70	26	43333	30058	69%
Giant Hogweed	70	7	407	407	100%
Purple loosestrife	70	7	25043	24600	98%
Invasive Knotweeds	70	N/A	N/A	N/A	N/A
Totals	70	40	68,783	55,065	80%

Project Description:

The aim of this project was to provide wildlife habitat and other environmental benefits to Miller and Walker Creeks through the coordinated control of noxious weeds known to infest this area. The project surveyed the distribution of listed noxious weed species and developed priorities for control and eradication with landowners and other key stakeholders.

Infestations of policeman's helmet (*Impatiens glandulifera*), giant hogweed (*Heracleum mantegazzianum*), purple loosestrife (*Lythrum salicaria*) and invasive knotweeds (*Polygonum sp.*) were all determined to be present and significantly impacting the ecosystem functioning of the riparian ecosystems of Miller and Walker Creeks. Priorities for control of these weed species were determined in an order that would halt the displacement of native riparian vegetation.

Results: (Described in terms of how project addressed the original application criteria):

Criteria #1- Projects must be physically located within the Miller and/or Walker Creek watersheds. The project covered the riparian corridor from the mouth of Miller Creek at the Cove Private Park in Normandy Park to its intersection with Des Moines Memorial Drive S. and Walker Creek from its mouth at the Cove to the residential headwaters on the east side of Des Moines Memorial Dr. S on the north side of S 176th St. In addition, tributaries to the main reaches of both creeks were surveyed for any unknown noxious weed infestations. These areas included Sequoia creek which begins just east of SW 174th St. and flows into Walker Creek near 13th Ave. SW

Criteria #2: Projects must be on portions of the streams not owned by the Port. The project maintained the requirement to work within the Miller and Walker creek basins up to the Port but not within Port owned land. King County Noxious Weed Control Program (KCNWCP) staff did conduct annual surveys on Port owned property upstream of the project area, to ensure that seeds and root fragments were not moving down stream.

Criteria #3: Projects that increase fish use upstream of First Avenue South in Burien will not be considered. Projects must not create significant avian wildlife habitat within 10,000 feet of runways at Sea-Tac Airport. The primary goal of this project was to reduce the impact of invasive species and not designed to increase the habitat for avian

wildlife. The removal of noxious weeds to date has served to improve the stream habitat and encourage native plant re-growth and salmon habitat recovery.

Criteria #4: For projects proposed on private property, applicants must demonstrate how they will ensure continuing maintenance and protection of the project area and must clearly state how the project will benefit the community, as opposed to that property owner only. The applicants must also provide some form of written approval by the private property owner indicating their willingness for the project to be conducted on their property. Since 2006 each property owner that lives along the stretches of Miller or Walker creeks (regardless of whether they had the target noxious weeds) were initially contacted in early summer each year via a letter that notified the landowner of the proposed creek surveys and requesting relevant permission. After initial surveys were conducted landowners with weed infestations were again contacted via letter that included a liability waiver and permission to allow noxious weed control work to be done. If waivers were not returned landowners were then called or visited in person to obtain the necessary authorization. In three years of control work, only one landowner declined grant funded work and chose controlling his own noxious weeds.

To ensure post-grant funded maintenance the KCNWCP will continue to monitor these weed infestations and seek funding to achieve their control. The vast majority of the noxious weed sites along both creeks are dangerous and inaccessible to the average landowner. The KCNWCP program has developed a safe and effective system of survey and control. At this point, infestations of policeman's helmet, giant hogweed and purple loosestrife have been dramatically reduced. If one landowner does not control their weeds the efforts of noxious weed removal will experience a substantial setback. As in previous years all landowners will be contacted for permission; however, it is necessary to remind landowners these weeds are in fact their responsibility. The KCNWCP will welcome and encourage any efforts that may be made on the landowner's behalf. The most desirable scenario would be if the KCNWCP could operate as a "follow up" entity. However, as mentioned above, most of these infestations are dangerous and difficult to access. Success and efficiency will continue to require the cooperation of all landowners and managers involved.

Criteria #5: Project applicants must demonstrate willingness and ability to obtain their own permits where needed, such as a Hydraulic Project Approval from Washington State Department of Fish and Wildlife, 404 Permit from the Corps, and/or a 401 Water Quality Certification from Ecology. Necessary permits obtained were NPDES permit through the Washington State Department of Agriculture in compliance with section 401 of the Water Quality Act for 2006-2008, and a Significant Tree Removal & Pruning Permit from the City of Burien for 2006-2008. Additionally, KCNWCP personnel carry the aquatic endorsement with WSDA issued pesticide application licenses and a HPA permit from the Washington Department of Fish and Wildlife.

Criteria #6: Projects must be able to provide a demonstrable benefit to salmon or aquatic habitat. Preference will be given to projects that include a physical improvement to the stream environment, as opposed to educational or other types

of programs that do not result in a physical improvement. The work funded by this grant was primarily used for surveying and removal of noxious weeds along the stream corridors. The weed species targeted are listed by the Washington State Weed Board and designated by the King County Noxious Weed Board and designated as species with significant impact to the state's natural resources. The noxious weeds that were targeted for control or eradication were policeman's helmet (*Impatiens glandulifera*), giant hogweed (*Heracleum mantegazzianum*), purple loosestrife (*Lythrum salicaria*) and invasive knotweeds (*Polygonum sp.*).

Giant hogweed is listed on the Federal Noxious Weed List and is a Class A noxious weed in the State of Washington; therefore, control is required. Giant hogweed can aggressively out compete native vegetation and increase soil erosion especially in riparian environments. It is also a public health hazard due to the phototoxic properties of the watery sap when it comes into contact with human skin. Giant hogweed occurs sporadically along Miller creek and has the ability to produce abundant amounts of seed that disperse well in moving water; therefore, making stream habitats conducive to substantial infestations.

Policeman's helmet has proven to be the greatest infestation of regulated noxious weeds along Miller Creek. It is a Class B noxious weed in Washington State, and it is considered one of the top 20 invasive plant problems in Great Britain. Policeman's helmet rapidly colonizes stream banks because each plant produces up to 2500 seeds which can create a density of between 5000 and 6000 seeds per square meter on the ground. It displaces native vegetation and competes for resources and pollinators, resulting in a reduction in growth and seed production of native species. Fortunately it is an annual, and the kind of consistent and thorough control work that has been enacted through this grant project has reduced the seed bank population and is working toward successful eradication of this invasive plant. In addition, when dense patches of policeman's helmet are removed native plants germinate and act as place holders to help reduce the policeman's helmet patch density next year.

Purple loosestrife is a Class B Noxious Weed in Washington State and its control is required. It is an emergent perennial that reproduces vegetatively and by seed. An individual plant spike can produce up to 120,000 seeds that remain viable for up to three years. Purple loosestrife can quickly form dense monotypic stands and is known to clog waterways and destroy fish habitat. Along the main stretches of Miller Creek purple loosestrife was uncommon and was rarely found along Walker creek at all. Where purple loosestrife has been a problem is at the headwaters of Walker Creek in the residential area on the east side Des Moines Memorial Dr., also a section of creek between Ambaum and 1st Ave. S and at the mouth of both creeks at The Cove.

Invasive knotweeds, listed as Class B Noxious Weeds, are the only plants that were targeted by this project that are not designated for control in King County. There are two reasons for inclusion into this work. First, this plant is predominantly spread by the movement of water through the creek system and second it is highly recognized as a problem species in riparian systems by the public; therefore, there is strong public desire

for control. Invasive knotweeds colonize stream banks causing several problems including increased bank erosion and impacts to salmon resources. Invasive knotweeds build thick mats of dead stems over time, which act to prevent any other plants from germinating in the infested area. Knotweed infests substantial areas on both Miller and Walker creeks. Control work used a combination of stem injection and foliar spray to reduce the invasion of knotweed.

Criteria #7: Projects must not be inconsistent with applicable watershed management or basin plants, and must be developed based on accepted watershed analysis or stream assessment procedures. This project has continued to support restoration work within the Miller and Walker basins. The past three years have included involvement with 6 volunteer weed pulls with the stewards of The Cove, a 2006 workshop in Burien for Miller/Walker watershed landowners and a stream steward workshop at the Normandy Park Swim Club. Additionally, a constant involvement and dialogue with the WIRA 9 Basin Steward, Dennis Clark, the Stewards of The Cove and personnel from the City of Normandy Park and the City of Burien has kept our noxious weed removal strategies on target with good watershed management practices.

Criteria #8: Preference will be given to projects that provide meaningful restoration for the streams by resolving underlying causes of problems rather than treating symptoms. Through the consistent removal of noxious weeds that has occurred over the past three years of project funding the contribution of seeds from giant hogweed, purple loosestrife and policeman's helmet has been reduced. From chemical treatment of Invasive knotweeds the risk of root fragment from flooding events establishing new infestations further down stream has also been reduced. The type of weed removal is tailored to the plants greatest invasion mechanisms therefore, treating these invaders at the core of their invasion ability. Removing invasive weeds is treating a primary problem that facilitates later stream restoration.

Criteria #9: Projects must have clearly defined goals, implementation plans and performance standards. The targeted weeds for this work each have an individual management strategy. The specific project goals included:

1. Eradicate giant hogweed, policeman's helmet, and garden loosestrife from the Miller and Walker Creek riparian corridors in the defined project area.

Results: Each year from 2006-2008 the steps necessary to eventually eliminate giant hogweed, policeman's helmet and garden loosestrife have been met. In order to locally and permanently remove these plants from the system no plants should be allowed to produce viable seed. That goal was achieved 100% of the time for giant hogweed, 100% of the time for garden loosestrife (there was no garden loosestrife found) and by the close of the 2008 season 100% of the time for policeman's helmet. These goals need to continue to be met for the next 5 years to achieve long-term success.

2. Establish the distribution of purple loosestrife and invasive knotweeds in the project area, develop priorities for control with all relevant stakeholders, and begin control measures to reduce area of infestation.

Results: All areas in the main reach and the majority of the tributaries for Miller and Walker creeks were surveyed. From initial surveys it was determined that all purple loosestrife would be controllable and the initial control work on invasive knotweeds would be within the scope of the project. Control measures were initiated on both weed species and annual control achieved 99-100% of the time for purple loosestrife and between 94-97% of the time for invasive knotweeds.

3. Develop and implement a plan for perennial sowthistle control with the Cove and the City of Normandy Park.

Results: KCNWCP staff met with members of The Cove and the City of Normandy Park on multiple occasions throughout the three year cycle of the grant. Specific advice toward the control of perennial sowthistle was administered on multiple occasions. The Cove continues to work on removal of perennial sowthistle.

Overall Project Results:

Control methods used for each of these goals followed KCNWCP Best Management Practices (BMPs). Integrated pest management strategy (IPM) is a key component of the KCNWCP's established BMPs. Using the best control method based on weed, infestation location and stakeholder preference were always taken into account. Work was timed to achieve the most efficient control and prevent any further spread by seed or vegetative fragments.

Policeman's helmet was the most abundant noxious weed with the greatest chance of eventual eradication. It is an annual that if prevented from going to seed for five years and monitored can be successfully removed. Policeman's helmet is very easy to control manually and control work was implemented by KCNWCP staff and Washington Conservation Corps (WCC) crew members. All infestations were mapped and controlled from 2006-2008. After hand pulling large infestations plants are placed on blue tarps, jumped on to crush and left to decompose/dry for several weeks before tarps are removed. Smaller, sporadic plants are pulled and bagged before going to the landfill. See map 1

Controlling giant hogweed can also be significantly impacted within a five year range of time. Prevention of seeding along with seed predation exhibits great results. All plants along Miller creek were surveyed and manually removed by digging at least 6 inches of the central root. This was carried out by KCNWCP and/or WCC. See map 2

Purple loosestrife is a perennial plant that has an extensive root system and often requires a more intensive control effort. For isolated, small infests, manual control was

implemented. Effective control for larger infestations required the use of approved herbicide. See map 2

Invasive knotweed control work has proven to be more widely spread than originally thought. Despite an increased density and distribution significant progress has been made. Each year surveys were conducted to assess the extent of knotweed prior to control work. Control work included stem injection of herbicide by WCC crew and KCNWCP personnel with follow up foliar spray of an approved herbicide by a hired contractor. See map 3

Performance targets set by KCNWCP in 2005

- 1.) 80% annual control of targeted noxious weeds
- 2.) 90% reduction in area of policeman's helmet, giant hogweed and garden loosestrife infestations over 3 years
- 3.) 50% reduction of purple loosestrife, and invasive knotweed infestations over 3 years.

Performance standards achieved by KCNWCP as of 2008

- 1.) Only in 1 instance in 1 year did less than 97% of targeted noxious weeds get controlled.
- 2.) Presence of policeman's helmet was reduced from and infested area of 27,000 ft² to 3,900 ft² with an average control percentage of 90% between 2006-2008. Giant hogweed was controlled 100% of the time each year with an area reduction from 445 ft² to 128 ft². Although Lake Burien is infested with garden loosestrife and is an upstream tributary none has been recorded on either Miller or Walker creeks.
- 3.) There has been a 65% reduction in the area infested by invasive knotweed with no less than 97% control of all known infestations in each given year. Purple loosestrife parcel infestations were reduced from 24 to 8 by project's end with 99-100% control of plants each year and the remaining infestations are significantly less dense than they were before treatment..

Criteria #10: Projects must be cost effective. Cost efficiency was maintained by combining survey work and control work when possible. This was an effective strategy with small infestations of policeman's helmet and giant hogweed. This combined survey and control work labor thus increasing the efficiency and reducing the number of return visits to individual sites. At the time of survey, larger infestations that required work crews or more intensive control methods were noted using GPS technology. Control work was then scheduled for implementation before plants set seed maximizing work efforts.

Criteria #11: Where likely to be required by permits (depending on type of project), project scope and budget must include a post-project monitoring plan(s). Monitoring

will continue as KCNWCP's annual survey data collection requirements per RCW 17.10. An Access database to track listed noxious weed infestations over the course of time is already used by the Program and will be instrumental in post-project monitoring and follow up coordination. Monitoring will follow established protocols of the KCNWCP. Both streams will be surveyed annually until no listed species are seen for 5 consecutive years.

Criteria #12: Project objectives and timing should be planned so that known future projects, including other stream improvements, don't interfere with the project's success. Noxious weed control is required annually regardless of future work. The removal of seed and root fragment sources will aid any future projects by preventing noxious weed establishment in areas where weeds do not yet exist. The systematic approach of working from the headwaters down will prevent downstream seed and root fragment loading. Without the noxious weed removal efforts of this project, all other restoration efforts that occur along Miller or Walker creeks will be negatively impacted by these targeted noxious weed species.

Criteria #13: Preference may be given to projects that include matching funds or in-kind support.

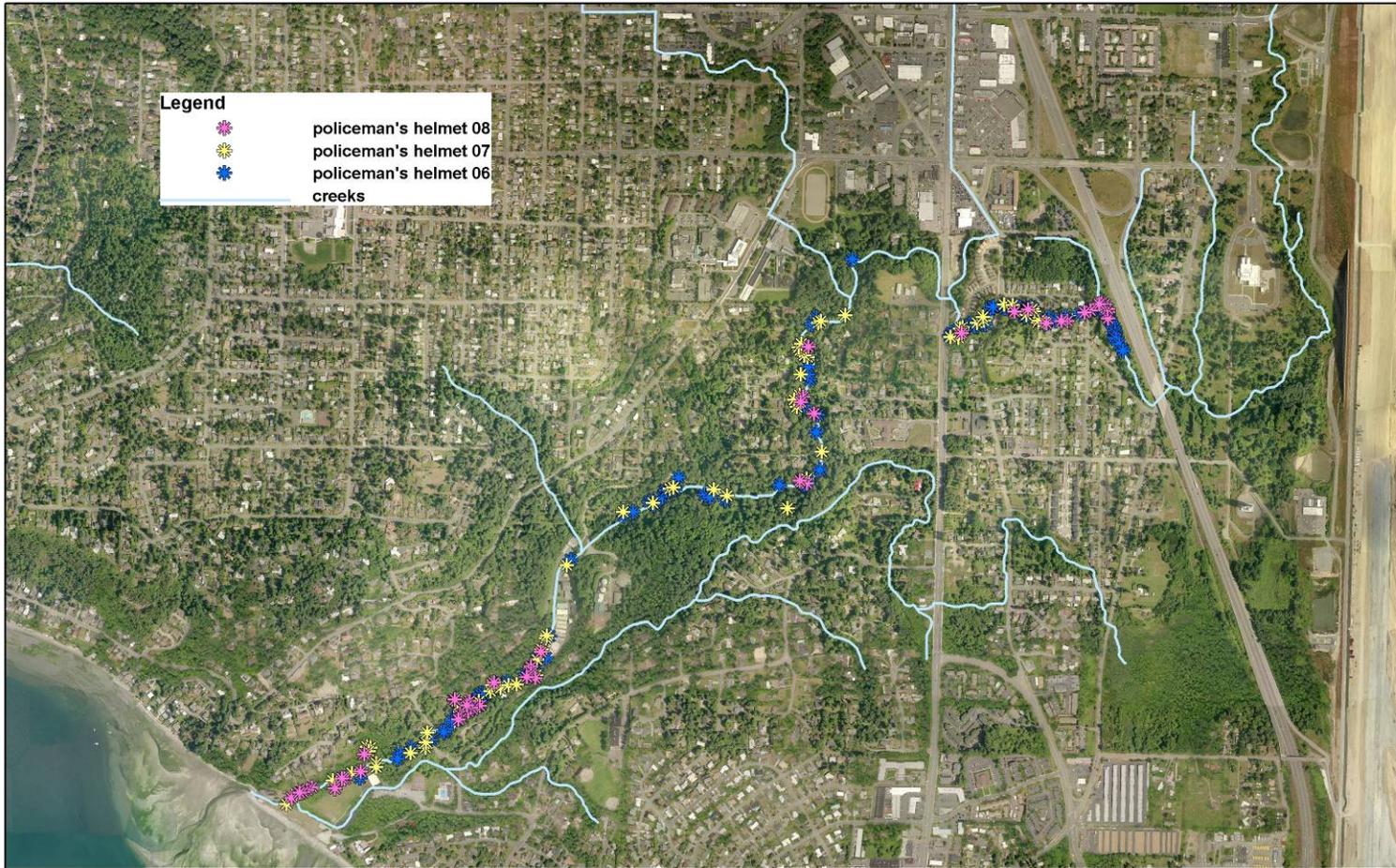
Allocation of Port of Seattle funding and match funding for this project is as follows:

	Port of Seattle	King County Noxious Weed Control Program	King Conservation District
Year			
2006			
Contractors	\$5,908.93		
Equipment & Materials	\$1,569.18		
Staff	\$3,750.00	\$5,719.69	
2007			
Contractors	\$10,668.18		
Equipment & Materials	\$413.85		
Staff	\$3,564.00	\$11,593.74	
2008			
Contractors	\$4,944.00		\$5,409.45
Equipment & Materials	\$0		
Staff	\$4,181.86	\$4,719.88	
TOTAL	\$35,000.00	\$22,033.31	\$5,409.45

Conclusion

The Miller Walker Creek Noxious Weed Survey and Removal Project has achieved successful results and all priority targets outlined in this project's scope were accomplished. With this targeted funding, KCNWCP was able to conduct more intensive surveys to determine the full extent of the target weeds in the project areas, offer education and outreach opportunities to the public, and plan for more thorough and extensive noxious weed control. The work completed in this project will continue to provide substantial long-term environmental benefits to the riparian ecosystem.

To be effective over time, the work begun in this project will need to continue as a long term strategic riparian noxious weed control program. A significant outcome of the project has been developing the communities' capacity to implement this long-term strategy by bringing the areas of noxious weed infestations down to a more manageable level. Future priorities for the project include monitoring and follow-up of treated sites, rapid-response control of newly identified infestations, and continued public outreach. With continued support and funding, this strategy can be implemented successfully.



Legend

-  policeman's helmet 08
-  policeman's helmet 07
-  policeman's helmet 06
-  creeks

Miller & Walker Creek Watershed

Policeman's helmet control 2006-2008




King County
 Department of
 Natural Resources and Parks
 Water and Land Resources Division
Noxious Weed Control Program



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Miller & Walker Creek Watershed
 Purple loosestrife & giant hogweed control 2006-2008

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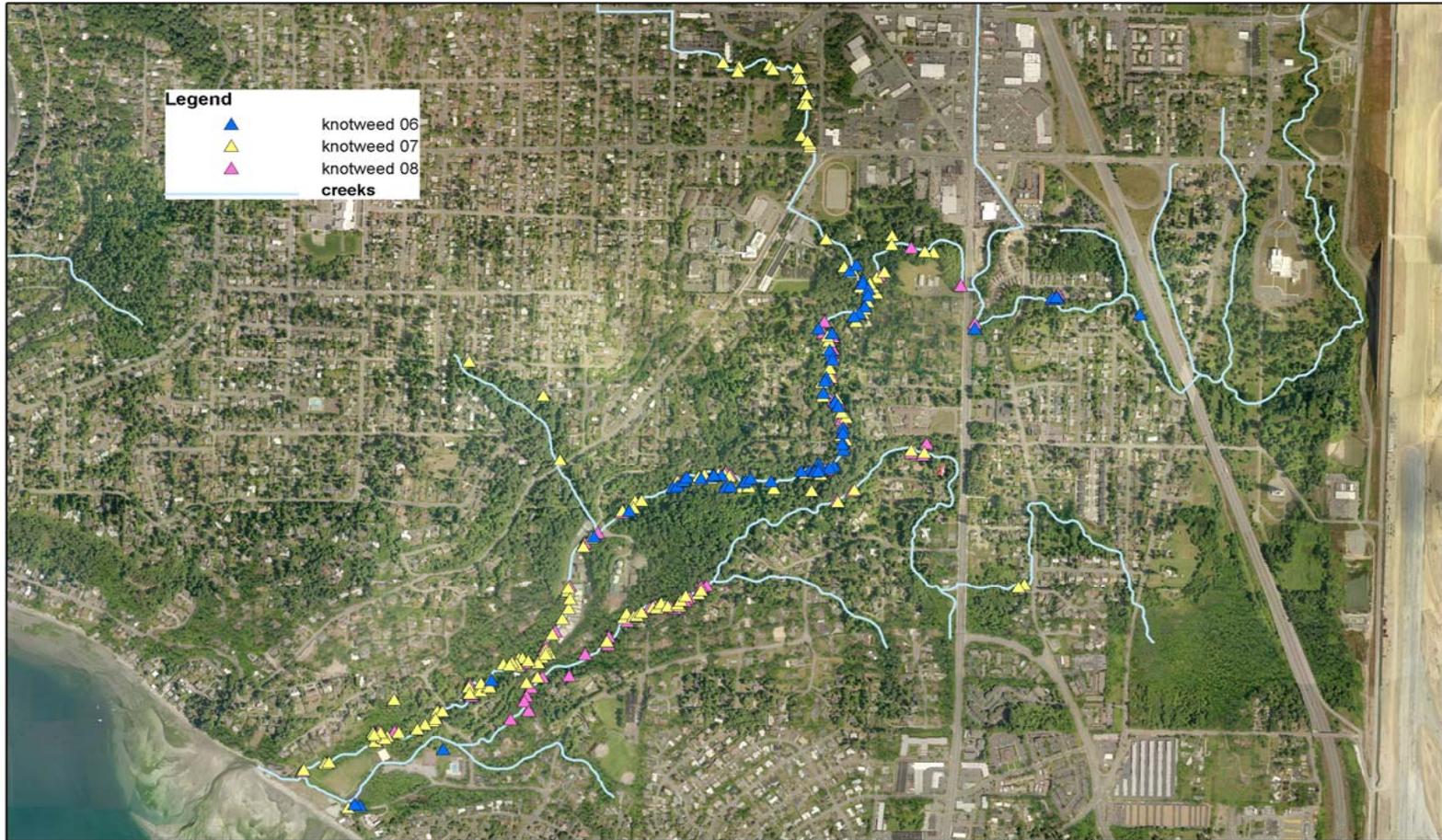
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Miller & Walker Creek Watershed

Invasive knotweed control 2006-2008



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