DEPARTMENT OF ECOLOGY
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WATER QUALITY PROGRAM

2009 *Spartina* Eradication Program
Sediment Monitoring Report

Post treatment 2008 looking north along the Long Beach Peninsula from Tarlatt Slough.

January 2009

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Extreme care was used during the compilation of the maps in this report to ensure accuracy. However, due to changes in data and the need to rely on outside sources of information, the Department of Agriculture cannot accept responsibility for errors or omissions, and, therefore there are no warranties which accompany this material.

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EXECUTIVE SUMMARY:

Spartina is an aggressive aquatic weed that negatively impacts Washington's waters. The Washington State Department of Agriculture leads the effort to eradicate *Spartina* using integrated pest management (IPM) methods. The use of herbicides for aquatic plant management requires maintenance of a National Pollution Discharge Elimination System permit (NPDES). To detect any pollution from herbicide use and to meet the requirements of the NPDES permit, WSDA monitored sediments at *Spartina* control sites in Pacific County following the 2008 treatment season. Kindred Island, Tower Slough and two sites on the Long Beach Peninsula in Willapa Bay were monitored for glyphosate and imazapyr in sediments. No imazapyr was detected in these sediment samples. Results of the glyphosate assay are pending and expected by February 2, 2009.

BACKGROUND:

Spartina is an extremely damaging biological invader with the potential to harm the ecosystems and economies of our state's estuarine waters. The Washington State Department of Agriculture (WSDA) is the lead agency charged with eradicating this aquatic nuisance species from Washington State's shores. WSDA partners with a wide range of federal, state, and local agencies, tribal governments, and non-profit organizations to conduct this work. WSDA and its cooperators adhere to IPM methods of controlling Spartina; including mechanical and chemical techniques.

The use of herbicides in and around the aquatic environment demands a high degree of caution to avoid inadvertently polluting the environment. The legal use of aquatic herbicides requires the maintenance of a National Pollution Discharge Elimination System (NPDES) permit. The NPDES (#WAG-99300) permit for *Spartina* is maintained by WSDA as the lead agency for *Spartina* control activities in Washington.

The compliance schedule for NPDES permit requires WSDA to monitor in areas affected by *Spartina* control activities. The Spartina program uses restricted use herbicides containing the active ingredients glyphosate and imazaypyr labeled for aquatic use. In 2008, WSDA monitored for the presence of these herbicides in sediments at locations where Spartina control activities occurred. These sampling events were scheduled to occur during early December 2008. However, due to inclement weather, road closures, and tidal heights sampling did not occur until early January 2009. These protocols are designed to fulfill the Aquatic Noxious Weed Control National Pollutant Discharge Elimination System Permit (#WAG-99300).

OBJECTIVES:

There were four major objectives of the 2008 sediment monitoring:

- Determine the amount of imazapyr and glyphosate residue in the sediments at a *Spartina* control site with multiple years (2006 and 2007) of aerial application of herbicide and subsequent ground treatments.

- Determine the amount of imazapyr and glyphosate residue in the sediments at a *Spartina* control site with one year of aerial application of herbicide in 2006 and subsequent ground treatments.

- Determine the amount of imazapyr and glyphosate residue in the sediments at a *Spartina* control site with multiple years of ground application.

- Determine the amount of imazapyr and glyphosate residue in the sediments at a site that has not been treated for *Spartina* utilizing herbicide since 2006.

To evaluate these objectives sampling occurred at four sites; Kindred Island area in north Willapa Bay, Tower Slough area in northeastern Willapa Bay and two sites on the central Long Beach Peninsula. Table 1 details the monitoring and treatments for each these sites.

Table 1: 2009 sediment sampling and treatment regimes in Willapa Bay.

Sample Location	Application Type	Herbicide	Infestation Type	Sample Type
Kindred Island	Multiple aerial 2006 and 2007 Ground 2008	Imazapyr/Glyphosate	Meadow moving to scattered	Composite Sediment
Tower Slough	Aerial 2006 and Ground 2007 and 2008	Imazapyr/Glyphosate	Meadow moving to scattered	Composite Sediment
Long Beach Peninsula -- North	Ground 2006 - 2008	Imazapyr/Glyphosate	Meadow moving to scattered	Composite Sediment
Long Beach Peninsula -- South	Ground 2006 Manual 2007 - 2008	Imazapyr/Glyphosate	Meadow moving to scattered	Composite Sediment

TREATMENTS:

Spartina treatments occurred between June 1 and October 30, 2008. All treatments were conducted by applicators licensed by WSDA. Private landowners, United States Fish and Wildlife Service, WA State Department of Fish and Wildlife, WA Department of Natural Resources, WSDA, and county personnel conducted applications. All applications were made following the appropriate federal and state approved product labels and all provisions of the Aquatic Noxious Weed Control NPDES permit.

A total of over 225 acres were treated with glyphosate and imazapyr throughout the 2008 treatment season in Willapa Bay. The groups conducting control made use of integrated vegetation management (IVM) strategies; including chemical, mechanical, and manual control approaches. All cooperators followed the guidelines identified in the Statewide *Spartina* IPM Plan.

SAMPLE LOCATIONS:

Within Willapa Bay, four sampling sites for glyphosate and imazapyr sediment monitoring were chosen. Kindred Island and Tower Slough are sites where past aerial applications have been followed by more recent ground applications. The sites on the Long Beach Peninsula have had distinct ground application regimes. Monitoring in these locations is designed to detect any residual herbicide within the environment from current and past herbicide applications. Figure 1 shows the locations of the Willapa Bay sites.

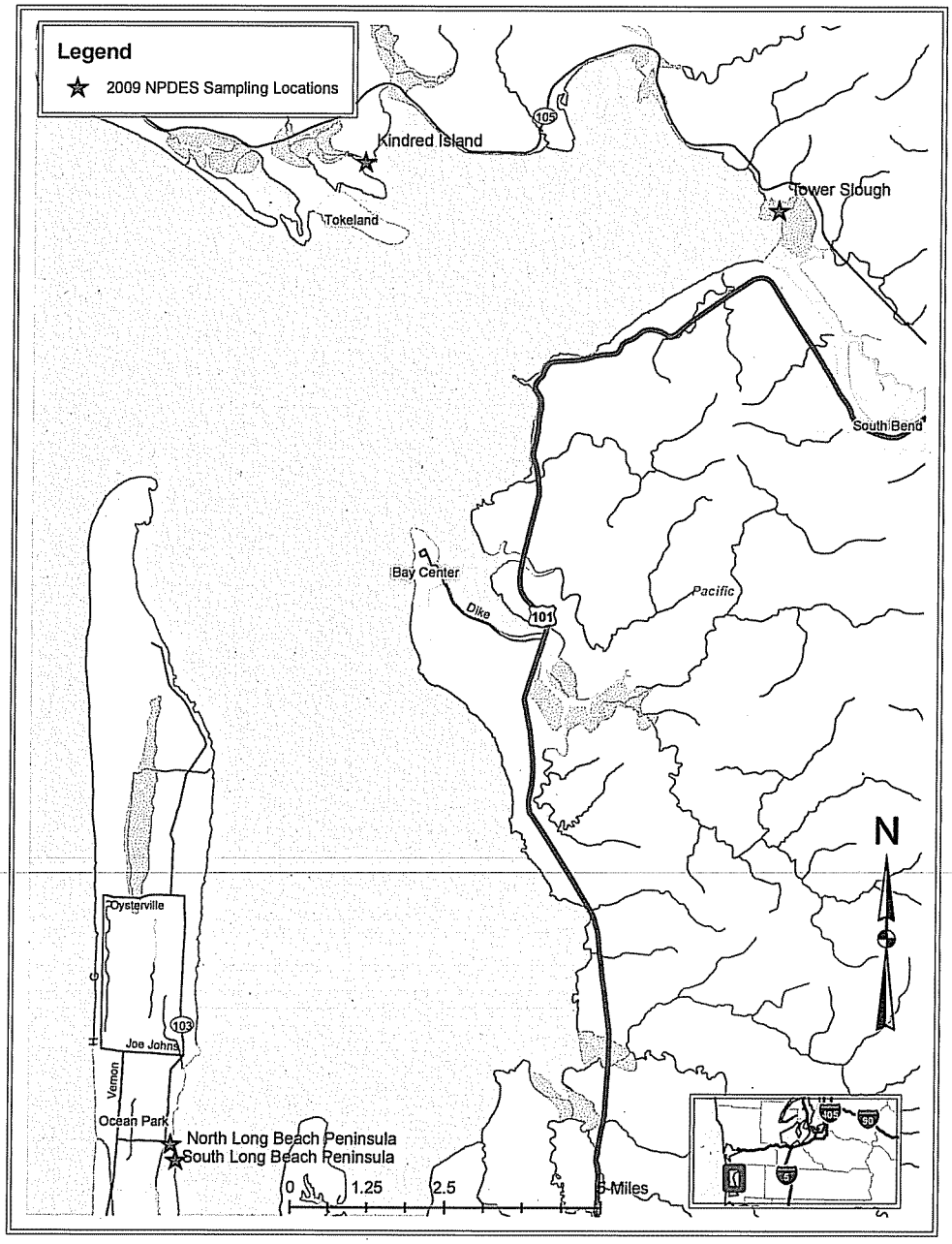

Figure 1: Willapa Bay sediment monitoring sites for the 2009 NPDES monitoring.

At each sediment sample area, a sample consisted of ten individual sub-samples. Each sub-sample's location was recorded with GPS coordinates. The top 10-centimeters (cm) of sediment were retained at each location to reflect recently deposited material. A sample was considered acceptable if it was not overfilled with sediment, the sediment surface was relatively flat, and the desired depth penetration was achieved. A sample containing excessive root, stubble or other biomass which would negatively affect its ability to be processed was repeated at a nearby location.

Upon retrieving a successful sample, the top 10-cm layer of sediment were removed with a stainless steel spoon. Any sediment in contact with the sampling device was not used. Sediment was spooned into a stainless steel bowl and stirred until uniform. A sub-sample was removed from the homogenate and placed in a sample container. All sample containers were labeled with unique sample identification numbers and placed in polyethylene bags. Chain-of-custody documents were maintained.

Sample Handling:
Samples were sent to an accredited lab on ice, via overnight courier. Two samples were stored overnight in a refrigerator before being shipped the next day. This delay was incurred because the timing of sampling did not allow for immediate shipping. All possible precautions were taken to avoid cross contamination, such as the use of designated glassware and equipment. A Washington State Department of Ecology accredited laboratory analyzed the samples using the EPA methods EPA 547 for glyphosate and EPA 8321A for imazapyr.

SUMMARY OF IMAZAPYR PRESENCE:
The sampling for imazapyr was designed to detect presence of imazapyr within the sediments at sites treated for *Spartina*. All samples analyzed had imazapyr levels below the practical quantitative limits (PQL) of the laboratory analysis. The PQLs for these assays was 0.05 mg/kg. The PQLs are dependent upon salinity and ambient water chemistry and varied through time and by water body. Table 2 details the results of monitoring for imazapyr in 2009.

Table 2: Summary of 2009 Imazapyr Monitoring Results. (ND = not detected)

Location	Sample	Sample date	Sample ID	Imazapyr (µg/l)
Kindred Island	Composite Sediment	1/15/09	11509-2	ND
Tower Slough	Composite Sediment	1/15/09	11509-1	ND
South Long Beach	Composite Sediment	1/16/09	11609-3	ND
North Long Beach	Composite Sediment	1/16/09	11609-4	ND

SUMMARY OF GLYPHOSATE PRESENCE:

The sampling for glyphosate was designed to detect the presence of the chemical subsequent to treatment of *Spartina.* Sample results are still pending, the analytical laboratory expects to report results by February 2nd, 2009. WSDA will forward these results to the Department of Ecology as soon as they are available.

Table 3: Summary of 2009 Glyphosate Monitoring Results

Location	Sample	Sample date	Sample ID	Glyphosate (µg/l)
Kindred Island	Composite Sediment	1/15/09	11509-2	Pending
Tower Slough	Composite Sediment	1/15/09	11509-1	Pending
South Long Beach	Composite Sediment	1/16/09	11609-3	Pending
North Long Beach	Composite Sediment	1/16/09	11609-4	Pending

SUMMARY:

To protect Washington's estuaries from the threat of *Spartina* WSDA employs a variety of techniques to manage this aquatic invasive species. The safe and legal application of herbicides is one method utilized by WSDA and its cooperators to eradicate *Spartina.* In order to satisfy the requirements of the Aquatic Noxious Weed Control NPDES permit, WSDA monitors impacted by *Spartina* control activities. During 2009, WSDA monitored for the presence of the herbicides glyphosate and imazapyr in the sediments of Willapa Bay. No imazapyr was detected in any of the samples analyzed during this period; glyphosate samples are pending.

Signatory Page

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiries of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

29 Jan 09

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