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## Swinomish Tribal Community

A Federally Recognized Indian Tribe Organized Pursuant to 25 U.S.C. § 476

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July 6, 2010

From: Office of Planning and Community Development  
Swinomish Indian Tribal Community

To: Shelter Bay Homeowner's Association, Residents of Eagle's Nest development

Subject: Notification of herbicide application on *Spartina anglica* in tidelands adjacent to Shelter Bay and Eagle's Nest.

State licensed aquatic herbicide applicators from the Swinomish Tribe will be conducting spraying of *Spartina* plants on certain reservation tidelands during the months of July and September 2008. These herbicide applications are being conducted under an NPDES permit for aquatic noxious weed control

After two successive years of herbicide control on the Reservation, *Spartina* infestations have been reduced by more than 85% from the beginning of the 2008 season. Some *Spartina* plants remain south of Eagle's Nest along the "Shortcut" channel as well as in the tidal marsh of Boathouse Cove. Additionally, a few plants could potentially remain within the Shelter Bay Marina, and in several locations along the adjacent channel.

Reservation tidelands, as well as the Skagit and Padilla Bay estuaries in general, are very vulnerable to infestations of this noxious, non-native marine plant. It is extremely important to the ecological health of our estuarine habitat that we eventually eradicate this plant in our region.

Spraying will occur during periods of low tides using a formulation containing imazapyr and glyphosate herbicides. This herbicide formulation has been extensively tested and is approved by Washington State for application in sensitive marine areas. Areas with *Spartina* growth will be sprayed once in July to reduce any seed production. This will be followed by a September round of spraying to eliminate remaining plants. There are no restrictions on post-application uses of the sprayed area, including fishing, shellfish gathering, crabbing and swimming. Herbicide will be applied by spot spraying individual plants using backpack sprayers. *Spartina* inside the marina will be sprayed from a small boat. A harmless blue dye in the spray mixture initially helps identify which plants have been sprayed and soon washes off.

Attached to this letter is an information sheet on *Spartina* control in Washington State marine areas. Additional information on *Spartina* control with this herbicide, including Material Safety Data Sheets, the current NPDES permit for *Spartina* herbicide spraying, and the Washington

State Environmental Impact Statement, can be seen in at the SITC Office of Planning and Community Development, 11430 Moorage Way (466-2631).



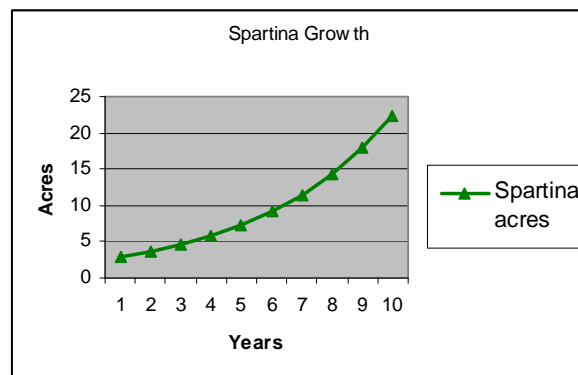
**Scott Andrews**  
**Swinomish Environmental**  
**Management Coordinator**

## ***Spartina* control and the use of Imazapyr and Glyphosate-based Herbicide mixtures in Marine Areas of Washington State**

### **Why is *Spartina* a problem in Puget Sound?**

The invasive noxious weed *Spartina anglica* (English cordgrass) is found in various intertidal areas of Puget Sound. It often out-competes native vegetation in existing salt marshes where, unlike native plants, it provides little forage benefit for native fish and wildlife. It can colonize many previously un-vegetated mudflats, where it eventually forms monotypic meadows that accumulate sediment. *Spartina* modifies the hydrology of estuaries by elevating some intertidal areas and causing increased tidal flooding in others due to decreased intertidal volume. *Spartina* invasions lead to reduced plant diversity and displacement of invertebrates, which are a major food source for shorebirds, waterfowl, and juvenile salmon. Infestations eventually destroy shellfish beds directly by converting them to marsh and indirectly by increasing flooding regimes.

*Spartina* reproduces vegetatively through rhizomes and tillers, and sexually through seed production. The combination of the two methods can cause an extremely rapid expansion rate when suitable habitat is available. Because even a fragment of root or rhizome can result in the re-growth of a plant it can be very difficult to eradicate, and even successful control efforts must be maintained with an active retreatment program for at least several years. With an external seed source contributing seed, control efforts can never really be completed (although they can be much reduced). *Spartina* sets seed in late summer. These seeds are transported by the tide and can be deposited great distances from the original plant. The following graph shows how rapidly *Spartina* acreage can accumulate once it becomes established (using a typical 20% per year rate).



### **How is *Spartina* eradicated?**

*Spartina* spreads quickly and is difficult to eradicate. A successful eradication program involves four steps:

- 1) Preventing an existing infestation from producing seed;
- 2) Treating an existing infestation for several consecutive years using integrated pest

management (IPM) techniques (including mechanical, chemical or manual control, or a combination of these methods);

3) After eradication is achieved, monitoring the area and removing new seedlings to ensure no re-establishment occurs; and

4) Continuing to survey shorelines, educate the public, and follow-up on possible sightings of new infestations.

### ***Spartina* control with imazapyr-based herbicide mixtures:**

The use of herbicide mixtures containing imazapyr has turned the tide on *Spartina* infestations in Washington State. Imazapyr has very high effectiveness on *Spartina*, especially if applied to a young, actively growing plant. Both Washington State and California were fighting a losing battle against *Spartina* infestations until imazapyr-based herbicides were approved for use and large scale spraying began.

### **Use of Imazapyr-based herbicides for control of *Spartina* in Washington State**

Washington State has approved mixtures of imazapyr and glyphosate herbicides for control of *Spartina*. These formulations were approved for aquatic use in Washington in 2004 after a thorough environmental impact statement was completed. The formulations within the mixtures are approved for use by the EPA, Washington, and California for use in sensitive estuarine environments.

Imazapyr is a systemic herbicide that is applied at a rate approximately one twelfth that required of the of the glyphosate-only mixtures previously used on *Spartina*. It is absorbed into the vascular system of the plant and works to permanently kill it by preventing the synthesis of three amino acids that only plants produce. Imazapyr works very slowly on a plant, frequently requiring months to cause complete plant death. Because of this, a small amount of glyphosate is also used in the *Spartina* herbicide mixture. This small amount of glyphosate, while not sufficient to kill the entire plant, does cause the above-ground growth to brown down after a few weeks, indicating that the plant was successfully targeted. For *Spartina* contained within a marsh, some desirable plants adjacent to sprayed plants may be killed by overspray, however our observation has been that the large amount of seed production and vegetative growth from unsprayed native plants rapidly fills in holes left by the dying *Spartina*.

Because they work to disrupt growth processes that only plants have, imazapyr and glyphosate are essentially non-toxic to animals. They have extremely low toxicity to fish, birds, insects, mammals, aquatic invertebrates, and even non-vascular plant life. Even direct contact with the applied mixture should be harmless to wildlife. Caffeine, aspirin and table salt are toxic to animals at lower amounts than the herbicide mixtures used for *Spartina* control. An average sized person would have to actually drink 25 gallons of the application mixture to reach lethal levels. Independent evaluations of imazapyr and glyphosate herbicide mixtures have concluded that neither workers nor the public are at any substantial risk from acute or long-term exposure. Areas where they are applied do not require post-treatment restrictions on use for fishing, shell-fishing, or swimming. Since the herbicide is applied no more than twice in any year, there is no opportunity for chronic exposures. Imazapyr and glyphosate, along with their approved

surfactants, are not carcinogens, mutagens, teratogens, or endocrine disruptors. They are rapidly degraded in the sediment (16 days) and very rapidly degraded in the water column (40 hours), and do not bioaccumulate.

Spartina herbicide mixtures based on imazapyr and glyphosate, after an extensive approval process, are now being used in some of the most sensitive estuarine areas on the west coast, including many public and commercial shellfish areas in Willapa Bay in Washington State, as well as many areas in Puget Sound. They are being used because they are extremely safe and have proven exceptionally effective and efficient.

# IDENTIFYING SPARTINA in PUGET SOUND & GEORGIA STRAIT



On this field guide you will find descriptions and photographs of the four *Spartina* species found in Puget Sound and Georgia Strait. Keep in mind that *S. anglica* is by far the most abundant. This guide also provides descriptions and photographs of several native species that are commonly confused with *Spartina* species.



All species of *Spartina* may be verified by the presence of fine, straight hairs at the ridged joint between the leaf blade and the stem (the ligule). To confirm, pull the leaf blade away from the stem to reveal these hairs. Other members of the grasses will have a thin membrane, a hairless band, or no band at all.

## IDENTIFYING SPARTINA:

*Spartina anglica* (English cordgrass) is most abundant in Island, Skagit, and Snohomish counties, but has been found in San Juan, King, Kitsap, and Jefferson counties (WSDA, 2003).

**General:** A perennial, salt-tolerant grass. Bright green to grayish green (fig. 1).

**Appearance:** highly variable depending upon invaded habitat type. Round, hollow stems up to 1.5m in height. Leaf blades 5-40cm long and 5-12mm wide. Distinguishing feature of *S. anglica* is strong 45 to 90 degree angle of the leaf blade to the stem (fig. 2).

**Growth pattern:** growth in circular clumps (fig. 3), called clones, that may coalesce into solid or patchy meadows. Generally dormant from November to March.

**Reproduction:** tall, often reddish stems with flower heads on mature plants from June through September, consisting of 2-12 'spikes' that fan out slightly (fig 4). Mature seeds drop in late summer and early fall. Germination occurs in spring (March-April).



fig. 1



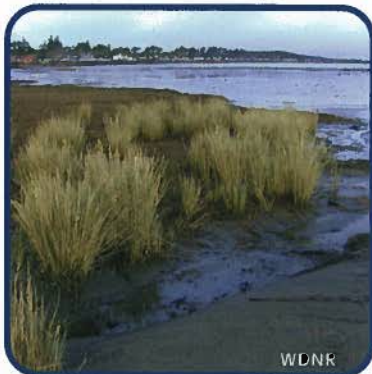
fig. 2



fig. 3



fig. 4



W.D.N.R.

*Spartina densiflora* (dense-flowered cordgrass) has been found in Race Lagoon on Whidbey Island (WSDA, 2003). Grayish in color, stems up to 1.5m tall. Lacks rhizomes, therefore tends to grow in tufts. The leaf blades are 12-43 cm long, narrow with curled in edges. Flowers from April to July.



F. Grevstad, UW

*Spartina alterniflora* (Atlantic smooth cordgrass) has been found in Padilla Bay in Skagit County, Clallam and Jefferson Counties (WSDA, 2003). Tall, reaches heights up to 2 m. Leaf blades 20 to 55cm long and protrude from the stem at a slight angle. Base of shoots are often a deep red color. Flowers from late July through October.



WSDA

*Spartina patens* (saltmeadow cordgrass) has been found in Dosewallips State Park in Hood Canal (WSDA, 2000). Thin flexible stems up to 1.2 m in height. Leaves 10 to 50 cm long, thin and rolled inward, appearing round. Generally found in high intertidal saltmarshes.

These 5 species are commonly confused with *Spartina*: The stem of a plant can help you quickly differentiate between grasses, sedges, and rushes. Feel the stem and use this rhyme... 'Sedges have edges, rushes are round, and grasses have holes all the way to the ground'.



*Distichlis spicata* (seashore saltgrass) is a native species of marsh grass found in salt marshes throughout the Puget Sound. Although it is a grass, it has a solid (not hollow) stem. When mature, this grass is much smaller than *Spartina*, reaching only 10 to 40 cm tall. The ligule has a ridge with very small, dense bristles.



*Scirpus maritimus* (seacoast bulrush) is a native sedge. The stem is distinctly triangular in appearance and feel. It is a very tall plant, reaching up to 2m in height. The leaves are bright green to yellowish green. It is found in low salinity salt marshes.



*Plantago maritima* (seaside plantain) is a rather small plant, only reaching 5 to 25cm tall. It is a taprooted perennial with numerous, fleshy leaves protruding from the base. A single plant will send up several flowering stems that are slightly taller than the leaves. The flower heads often appear hairy. This plant can be found in marshes, sand and cobble beaches and even popping up in crevices of large rocks.



*Leymus mollis* (dunegrass): This native grass also reaches heights up to 1.5m. The leaf blades are 6-15mm wide, generally wider than *Spartina*. The plant often has a distinctive bluish tint. The ligule of dunegrass has a short, thin membrane. It grows higher in the intertidal than *Spartina* (with the exception of *S. patens*) and is found along the upper fringe of marshes, sand and cobble beaches.



*Triglochin maritimum* (seaside arrow-grass), despite its name is not a grass. It can reach heights from 20 to 120cm tall, which is often why it is confused with *Spartina*. The leaves of this plant all extend up from a rhizome base, and are fleshy. The flowering stem is often quite taller than the leaves. Both the flowers and seeds are bead-like in appearance. It can be found in marshes and in the higher intertidal areas of mudflats and cobble beaches.

If you think you have discovered *Spartina* please call your local Noxious Weed Control Board.

- WA Noxious Weeds Control Board: (360) 902-2082
- Clallam County (360) 417-2442
- Jefferson County (360) 379-5610
- King County (206) 296-0290
- Kitsap County (360) 307-4242
- Island County (360) 240-5597
- San Juan County (360) 376-3499
- Skagit County (360) 336-9430
- Snohomish County (360) 862-7523
- Whatcom County (360) 354-3990
- WA Department of Agriculture (360) 902-1923
- British Columbia (Vancouver Aquarium) (604) 659 3503

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