

SEARCH/SPRAY EFFICACY RESULTS FOR SPARTINA IN WILLAPA BAY 2010

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Introduction: Achieving eradication of an aquatic invasive weed, like Spartina, is neither quick, easy nor inexpensive. To accomplish the task, it is critical that our current effort be examined to see where it could be improved.

Methods: Three separate studies were conducted in 2009. In study one, fifteen locations were surveyed between August and October along the Long Beach Peninsula (Table 1). The goal was to evaluate the percentage of plants found and treated. Sites were surveyed for visible Spartina that had been sprayed or not sprayed. These were differentiated based on color of the leaves. Plants turning brown, yellow or off-green were deemed sprayed; those still dark green were deemed not sprayed. In study two, eight sites across Willapa Bay were surveyed on November 4th (see figures). Plants were marked with Trimble equipment into one of six categories: <1' tall, between 1 and 2' tall, and >2' tall, and if they looked like they were unsprayed (dark green color) or if were likely sprayed and were turning off-color (light green/yellowish color). Plants that were brown were not GPS'd. The goals were to determine the remaining plant densities at various sites, determine what percentage of plants that looked like they were sprayed and are turning color actually die, and to mark plants for later assessment of the ability of spray teams to find and treat plants in 2010. In study three, individual plants at two sites were flagged as to the likely treatment they received in 2009. These plants were then followed in spring 2010 to assess the percent kill.

Results: Almost 5000 plants were counted to assess the spray teams' ability to find and treat Spartina (Table 1). Across the season, teams missed an average of 16%, with a low of 2% and a high of 29%. Early season assessment tended to have more misses since the sites might have only had one or two passes across it. Fewer plants were missed in mud than high marsh. By October all sites had had three to four passes. Despite these numbers of passes, there were still a lot of untreated plants at each site (Table 2, & all figures).

Based on the off-color of the visible green plants we found on November surveys across Willapa Bay, only 59% of the plants still visible (any shades of green) had been treated. It wasn't just the little plants that were being missed, as 1/3rd of all missed plants were >2' tall. Our April 2010 surveys at several locations indicated that > 85% of these "treated plants" were not dead and had new spring growth. The average density of remaining plants per acre was <1.6 plants. Just as disconcerting as these data are, were the studies on the percentage of treated plants that were actually not dying (Table 3). Only a little more than 50% of the treated plants appeared to be killed. A good earlier

spray provided the most kill, while the later spray by itself was not too effective. A booster second spray appeared to slightly improve efficacy over that of a poorly treated first spray. The degree of fall discoloration color is not too predictive of whether a plant will die or not, but no dark green plants died.

Conclusion: Results for 2009 were not dissimilar from our 2008 data where we found ~ 1/3 of the plants were missed. After four passes, some agencies were able to obtain success rates as high as 98%. However, this success was only within the corridor of where they were actually looking and treating. When we scouted outside that range we found a lot more plants. For example, the WNWR spray crew at Porter Point Unit found 98% of the plants along the high marsh/mud transition zone (only 33 plants out of 1676 missed), based on our 9/27/09 survey. However, our 10/9/09 survey was more extensive and followed every tidal gut to its source. We found 130 untreated plants, 1/4 of which were full grown, >3' tall. Thus the overall goal of eradication will remain elusive, if search/spray teams' successes are limited to the confines of the areas of their searches and they don't search everywhere.

One other result worth noting from these studies is the lack of treatment effectiveness. For plants surveyed in October (Table 3), 42% of plants that were sprayed recovered from the treatment by spring 2010. A greater percentage appeared to recover from the bay-wide survey done in November (Table 2).

In summary, while the overall move to eradicate *Spartina* is making great strides, there need to be significant improvements made in both finding and controlling *Spartina* to make the effort more cost-effective. Recommendations for accomplishing these tasks are presented in a compendium report titled "Suggestions to improve the process for eradicating *Spartina* in Willapa Bay 2010".

Table 1. Mid-summer & fall 2009 survey results for skipped (not sprayed) Spartina plants.			
Date assessed	Site information	Total plants	% miss
8 Aug	Oysterville, salt marsh north of cannery, 1/4 were hits but showing no sign of dying - low efficacy.	183	25
27 Aug	Porter Point , salt marsh and transition	783	10
4 Sep	Leadbetter, within salt marsh, north parking lot toward south.	230	29
4 Sep	Leadbetter, south of south parking, within salt marsh from slough to sedge meadow	425	12
4 Sep	Leadbetter, south of south parking, mud just beyond marsh	202	9
4 Sep	Mid-peninsula, north and south by S curve on Sandridge, salt marsh,	173	32
4 Sep	N Nahcotta, Sayce house to Sherwood forest, upper salt marsh.	130	27
11 Sep	N Nahcotta, Sayce to Sherwood recently sprayed (dye vs. no dye)	172	10
11 Sep	PUD substation to Moby Dick upper salt marsh only	64	14
11 Sep	Oysterville cannery to the North, upper salt marsh	274	16
11 Sep	Leadbetter salt marsh down to disk plots	101	21
27 Sep	Porter Point , salt marsh and transition	1676	2
2 Oct	Oysterville south to Weigart's	304	10
16 Oct	113th Tarlett Slough area south high marsh and mud/marsh	43	2
16 Oct	113th Tarlett Slough parking lot north narrow high marsh line only	71	15

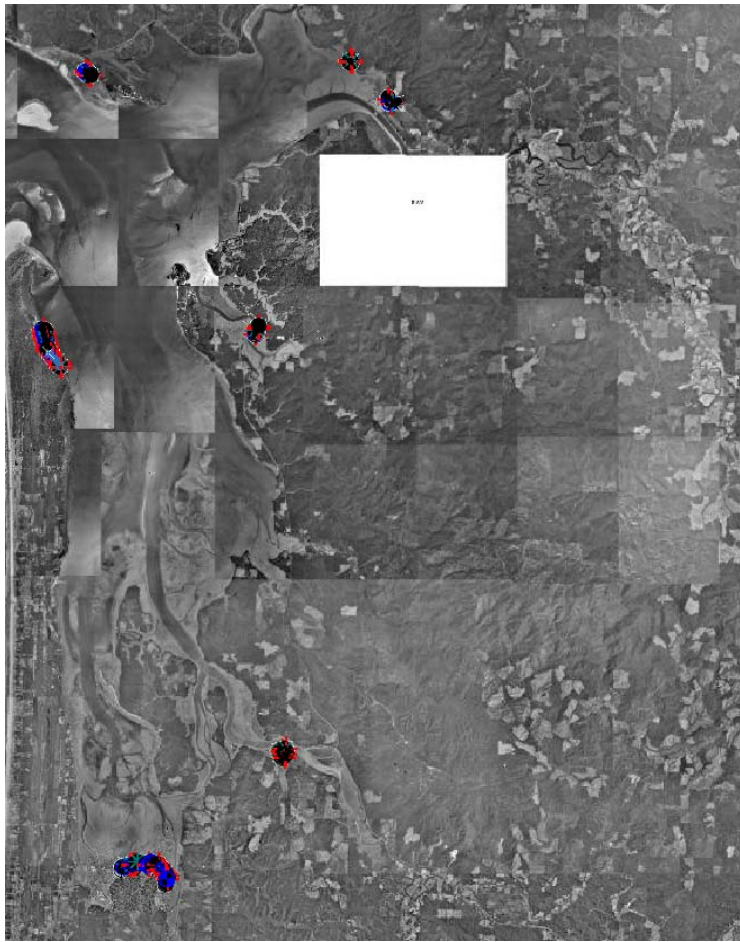
Table 2. November survey for green (untreated) and off-green (poorly treated) Spartina plants in Willapa Bay.

Site*	Total acres	Off-green Spartina (most likely treated, but not lethal)			Bright green untreated Spartina			% plants treated, but not likely to die (off- green)	Total remaining Spartina (treated & untreated)	
		plant ht (ft)			plant ht (ft)				# total plants/ site	# plants /ac
		<1'	1' -2'	>2'	<1'	1' - 2'	>2'			
Porter Pt.	208	18	21	28	8	21	33	52	129	0.3
Leadbetter between parking lots	36	41	60	12	27	40	1	62	181	3.1
Leadbetter south of south parking lot	18	5	7	6	11	14	9	35	52	1.0
Ellsworth Meadow	47	0	5	16	10	9	7	45	47	0.5
Palix River	7	3	7	3	27	20	16	17	76	1.9
Willapa Slough	47	2	1	3	2	2	8	33	18	0.1
North Willapa Meadow	5	0	8	10	5	13	22	31	58	3.6
Tokeland	14	19	13	5	17	10	3	55	67	2.6
Average								41	78	1.6

Table 3 Fall 2009/Spring 2010 survey for the effect of spray timing on efficacy of Spartina control in Willapa Bay.

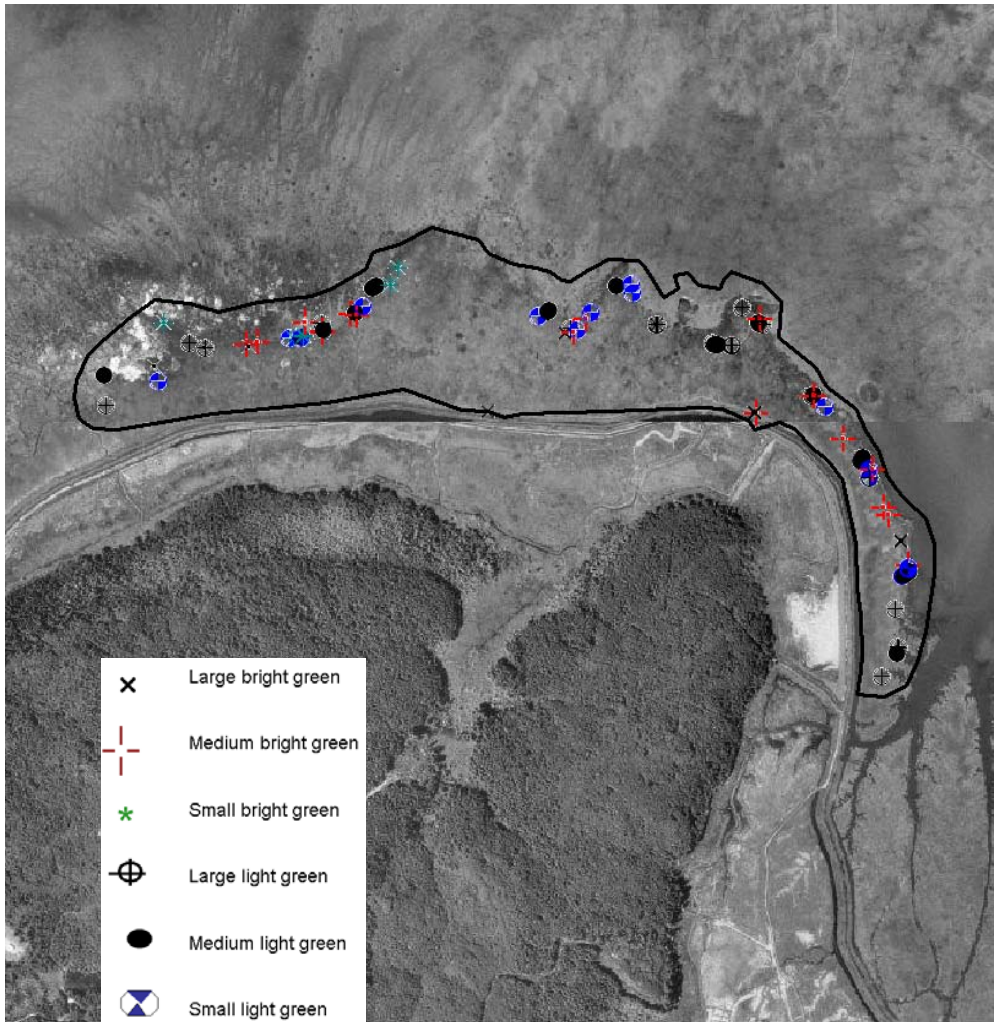
Treatment ranking on October 9th	11/13/2009			% off -color	3/17/2010
	Dark green	Off-green	Brown		% dead
No treated (dark green leaves)	5	3	3	55	0
Sprayed in October (green leaves, previously untreated, but has new blue dye)	4	9	0	69	25
Sprayed in summer, tops dead (brown leaves)	0	0	17	100	74
Sprayed in summer, doesn't look like it will die (off color – yellow greenish)	3	10	5	83	38
Sprayed in summer & Oct. (doesn't look like it will die (off color – yellow greenish leaves & new blue dye)	1	11	16	96	75
Total	13	33	41	85	42 % of total

Locations of sites surveyed in Table 2.



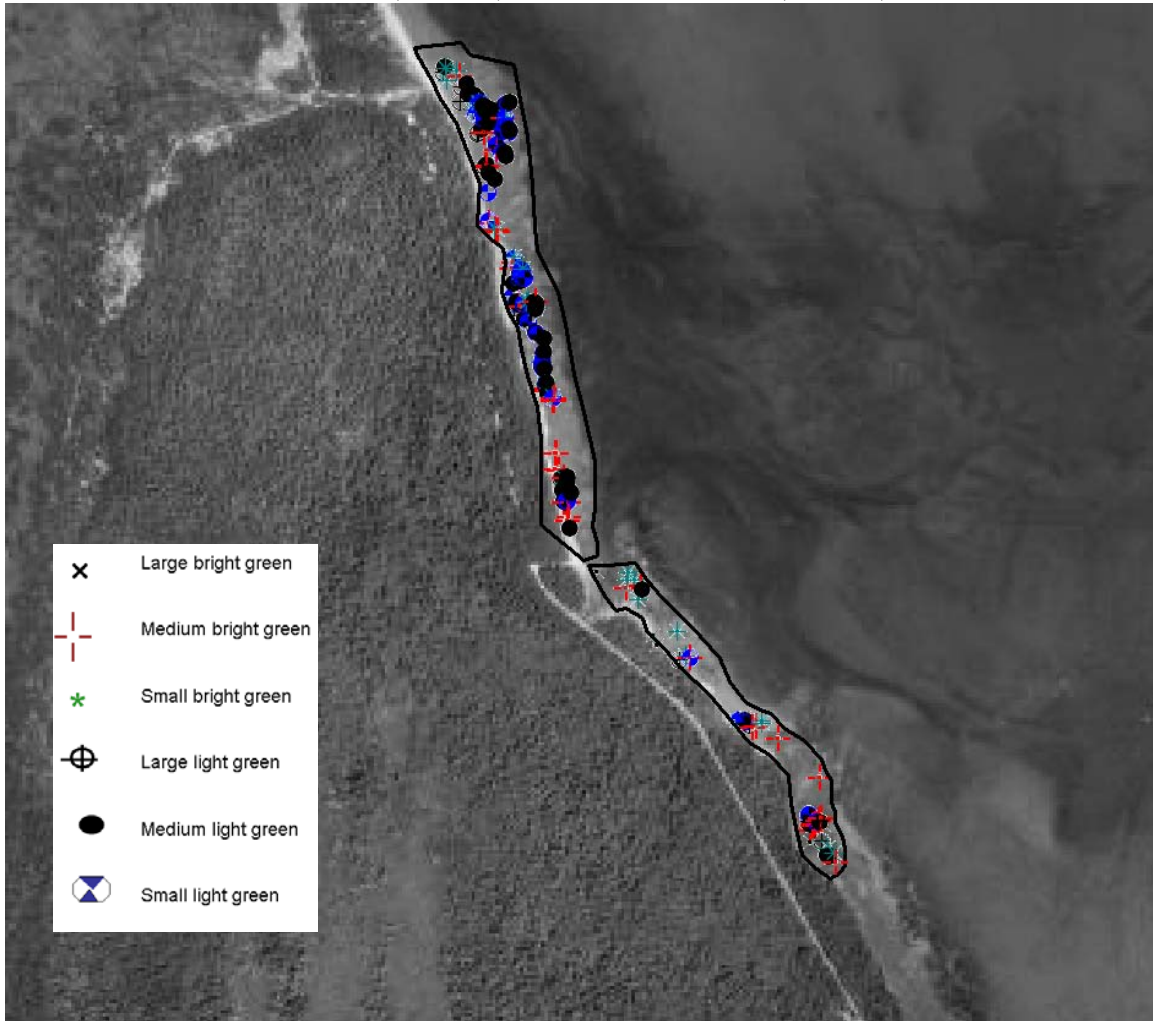
Porter Point

Total area walked: approx 208 acres



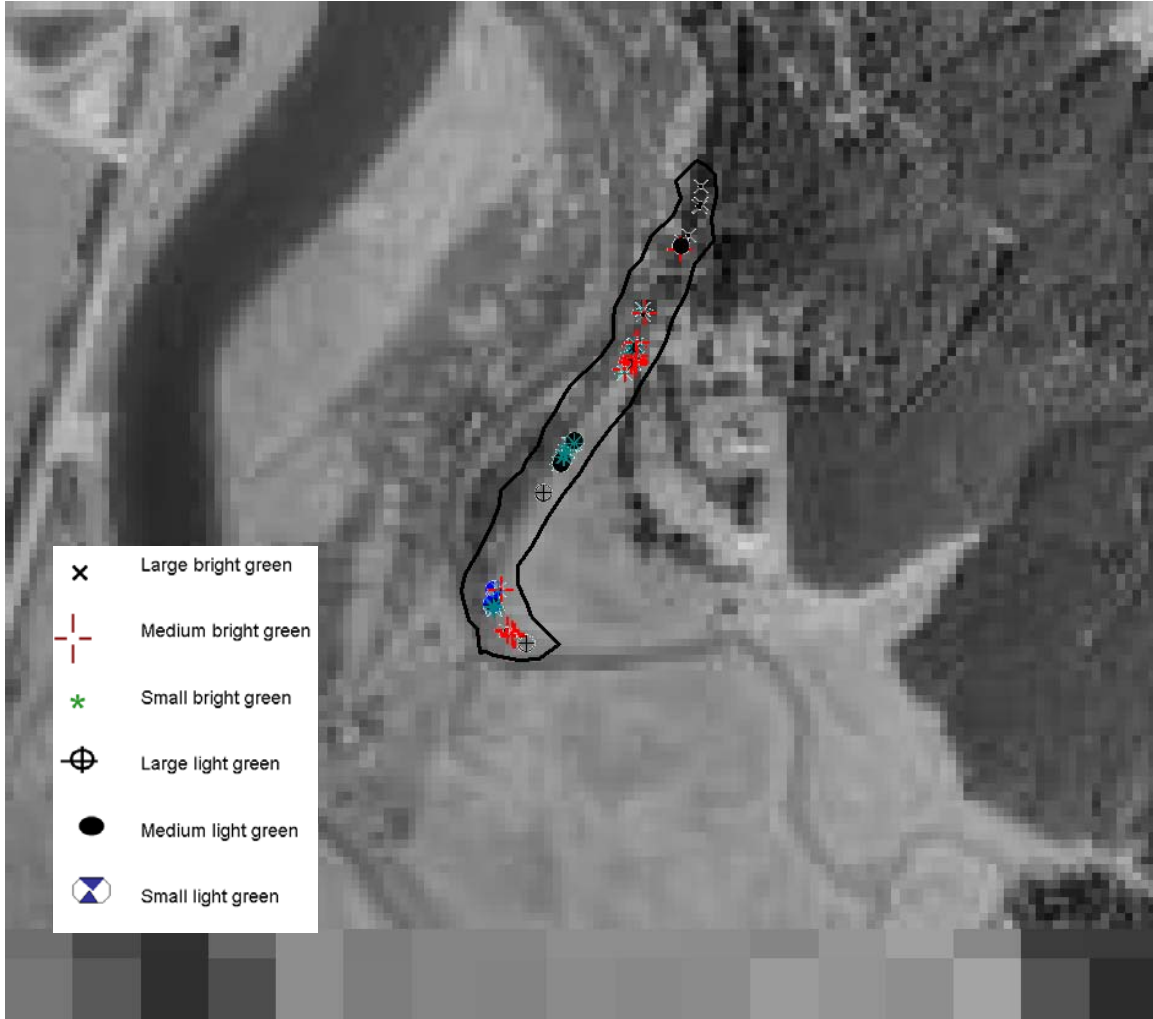
Leadbetter Point

Total area walked: North end (WDNR) 36 acres; South end (WSDA) 18 acres.



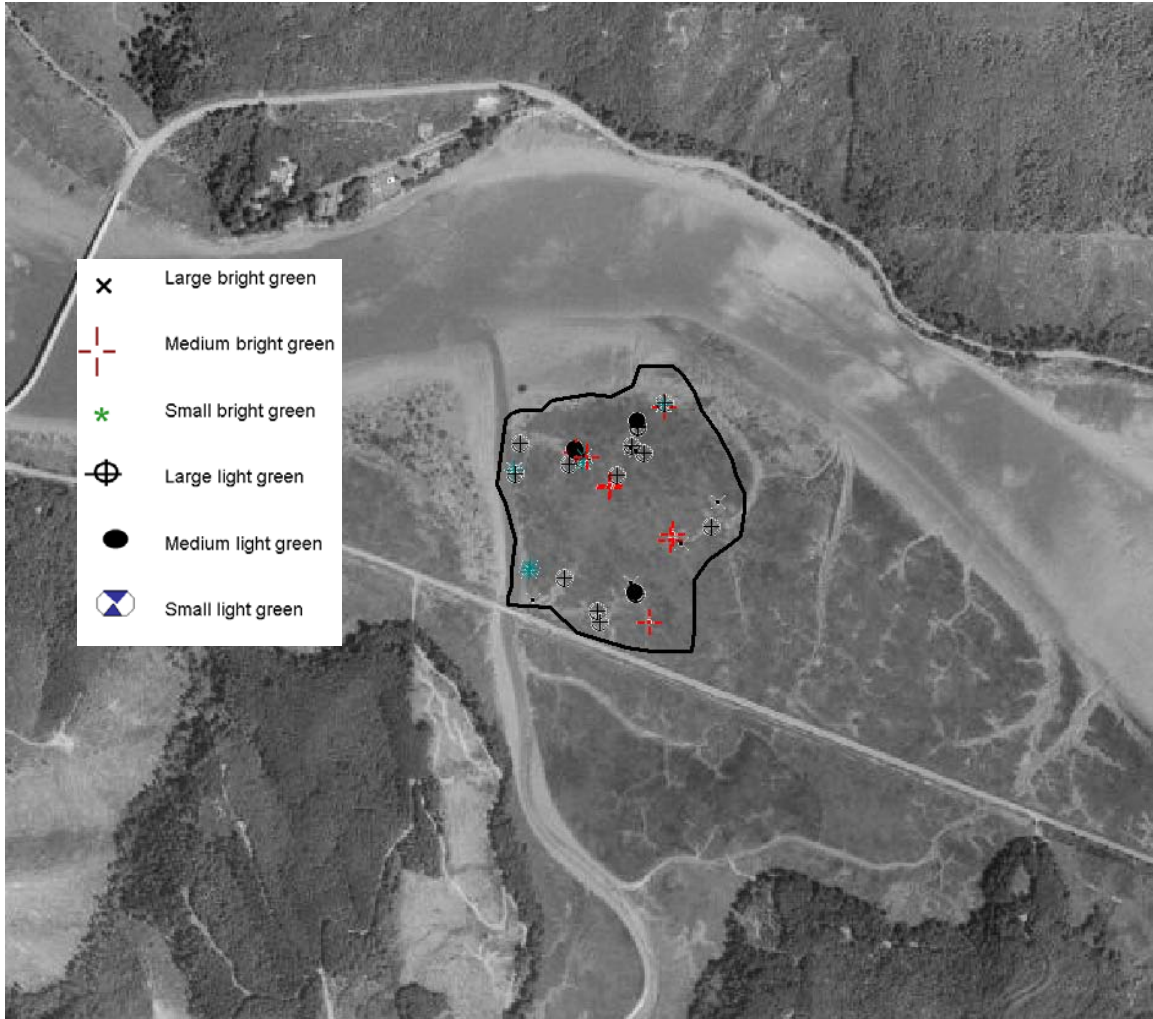
Palix River

Total area covered: 7 acres



Ellsworth Slough

Total area: 47 acres

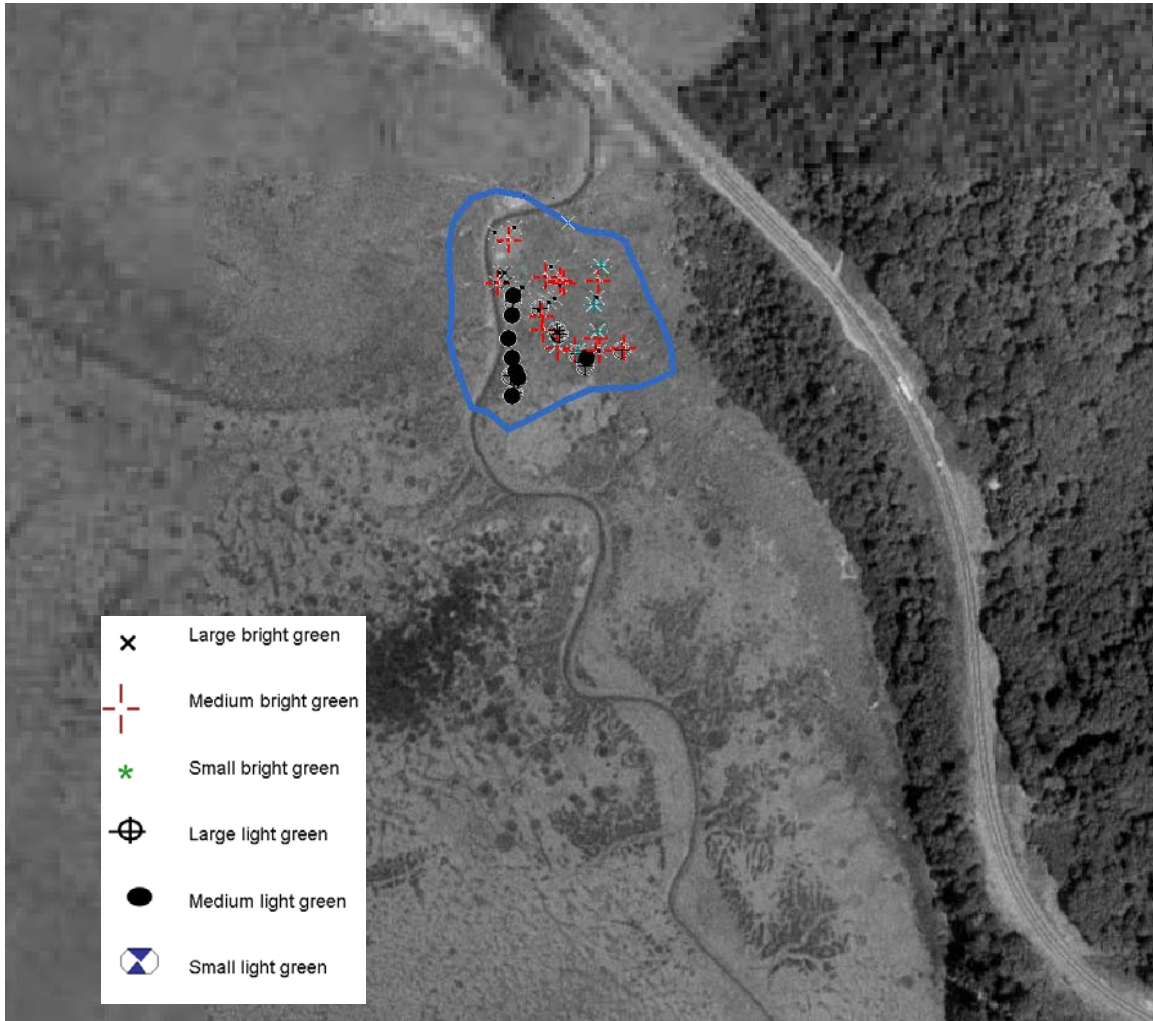


Willapa Slough

Total area covered: 4 acres



North Willapa Meadow
Total area covered: 5 acres



Tokeland

Total area covered: 14 acres.

