

Report to the Willapa National Wildlife Refuge

Preliminary Assessment of the Density *Spartina* Remaining in Fall 2009 in Select Sites in Willapa Bay.

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Objectives:

- 1) Determine density (plants per acre) of untreated *Spartina* in representative sites in Willapa Bay for 2010 season.
- 2) Determine the usefulness of late fall surveys for finding *Spartina* outliers.
- 3) Determine what % of plants that are treated and turn off-yellow but fail to turn brown, actually die.
- 4) Conduct an accurate population survey that will allow for the determination of the probability of a crew finding and treated every *Spartina* in area.

Methods: Eight salt marsh sites in Willapa Bay representing areas sprayed by different agencies were surveyed by walking in early November 2009. Sites were chosen based on ease of access by walking. All the salt marsh species (sedges, *Salicornia*, rushes, etc) had browned down and *Spartina* was clearly visible for 100' in any direction. The GPS coordinates of each plant were logged and each plant was placed into two color categories: off-green/yellow green and dark healthy green and one of three size categories: small <1', medium >1'<2', and large >2'. Healthy green plants were assumed to have not been sprayed since sites had not been treated for at least a month, off-green plants were assumed to have been sprayed and may or may not die. In Summer and Fall of 2010 these sites will be re-surveyed to mark for any new plants and assess what % of the untreated plants were found and sprayed and what % of the off-green color plants did not re-grow.

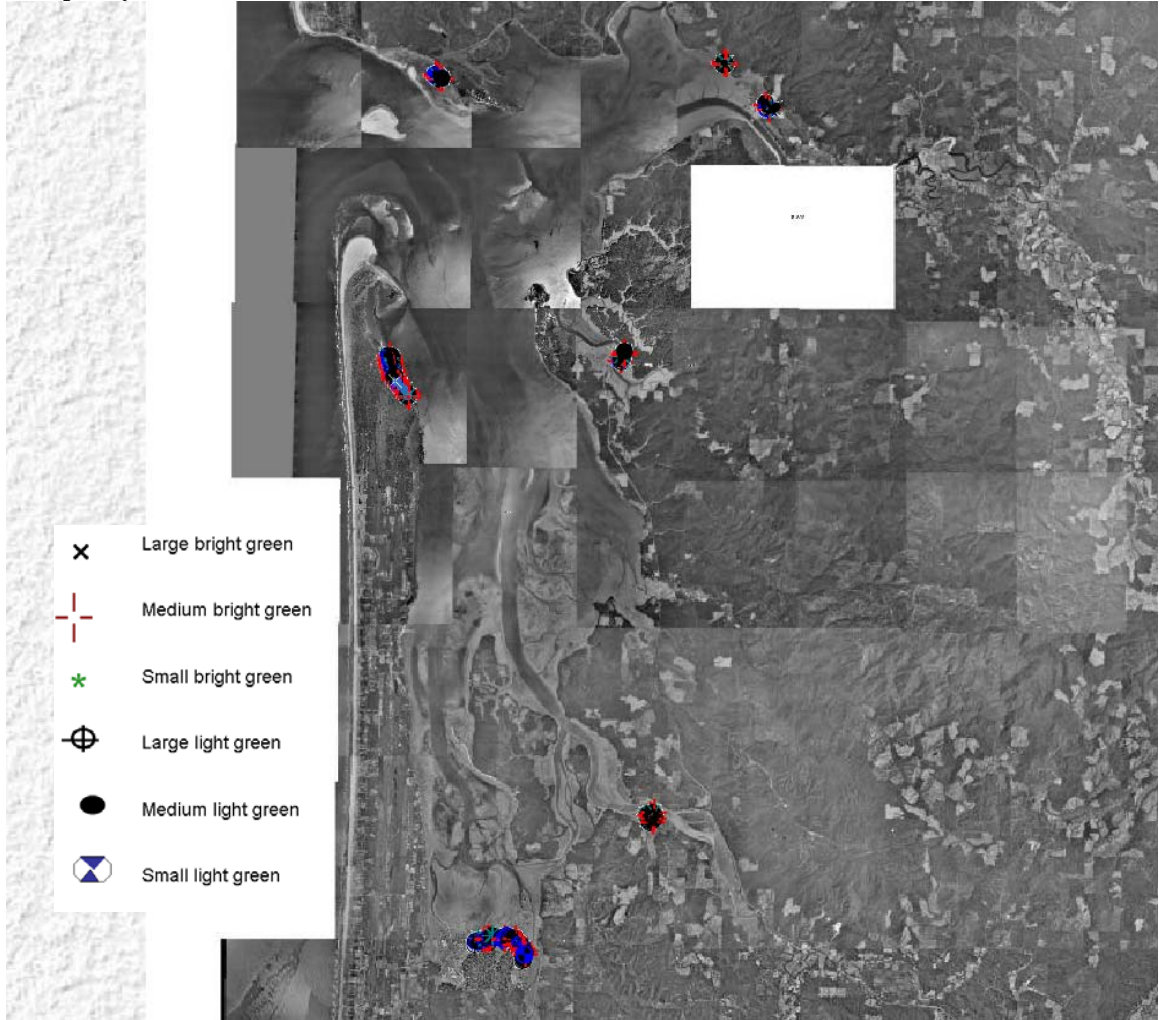
Preliminary results. A total of ~339 acres on 8 sites were surveyed. A mean of 3.3 untreated plants/acre and 2.6 per 100' of walking were found. Some sites were appreciably cleaner than other sites. Porter Point and Ellsworth slough has the lower density of untreated *Spartina* remaining at 0.3 and 0.5 plants/acre respectively, and Palix River and North Willapa River the highest at 10.9 and 11.6 respectively. Some sites, Palix River also had a higher density of total small plants/acre suggesting seedlings from 2008 or 2009 were established. Tokeland, Palix and Leadbetter had 4.2, 2.6, and 1.9 small plants/acre respectively, while Porter and Ellsworth had 0.1 and 0.2 small plants/acre respectively.

Late fall surveys appear to be a very useful technique for finding outliers. *Spartina* visibility once the salt marsh dies down is very good and allows for hundreds of acres to be surveyed in a short period of time. It is particularly useful for finding all large plants that were skipped or small seedlings that are too hard to see when the salt marsh plants are present.

Table 1. November 2009 survey of Spartina remaining in Willapa Bay

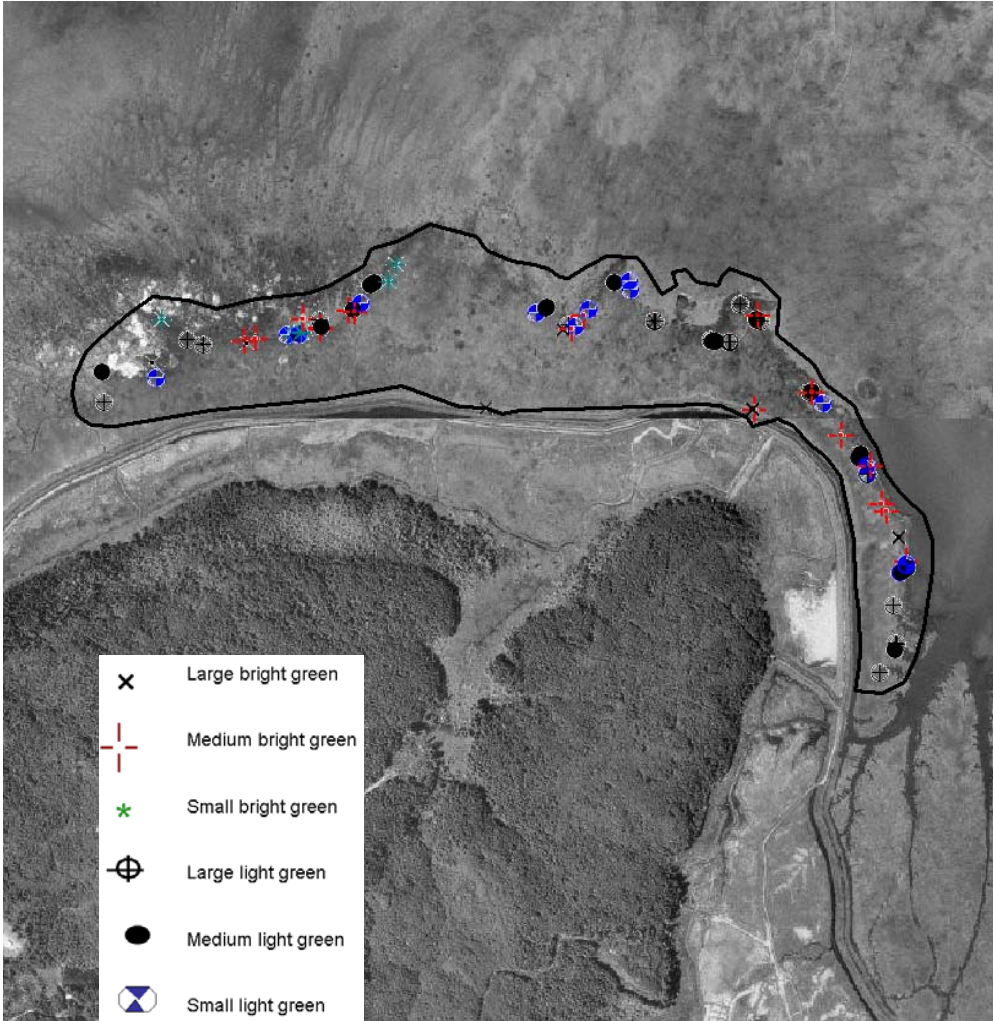
site	total acres surveyed	light/off green Spartina (likely treated, but not lethal)			Bright green Spartina (likely untreated)			total plants	total plants /ac	total untreated plants /ac	mean total plants/100ft of walking	mean total untreated plants /100 ft of walking	% untreated plants
		<1'	1' to 2'	> 2'	<1'	1' to 2'	>2'						
Porter Pt.	208.0	18	21	28	8	21	33	129	0.6	0.30	0.7	0.3	48.1
Leadbetter between parking lots	36.0	41	60	12	27	40	1	181	5.0	1.89	4.8	1.8	37.6
Leadbetter S. of S. parking lot	18.0	5	7	6	11	14	9	52	2.9	1.89	1.2	0.8	65.4
Ellsworth Meadow	47.0	0	5	16	10	9	7	47	1.0	0.55	2	1	55.3
Palix River	7.0	3	7	3	27	20	16	76	10.9	9.00	3.6	3.5	82.9
Willapa R Slough, W of Camenzind's	4.0	2	1	3	2	2	8	18	4.5	3	0.8	0.2	66.7
North Willapa Meadow	5.0	0	8	10	5	13	22	58	11.6	8.00	12	8	69.0
Tokeland	14.0	19	13	5	17	10	3	67	4.8	2.14	11	5	44.8

Willapa Bay



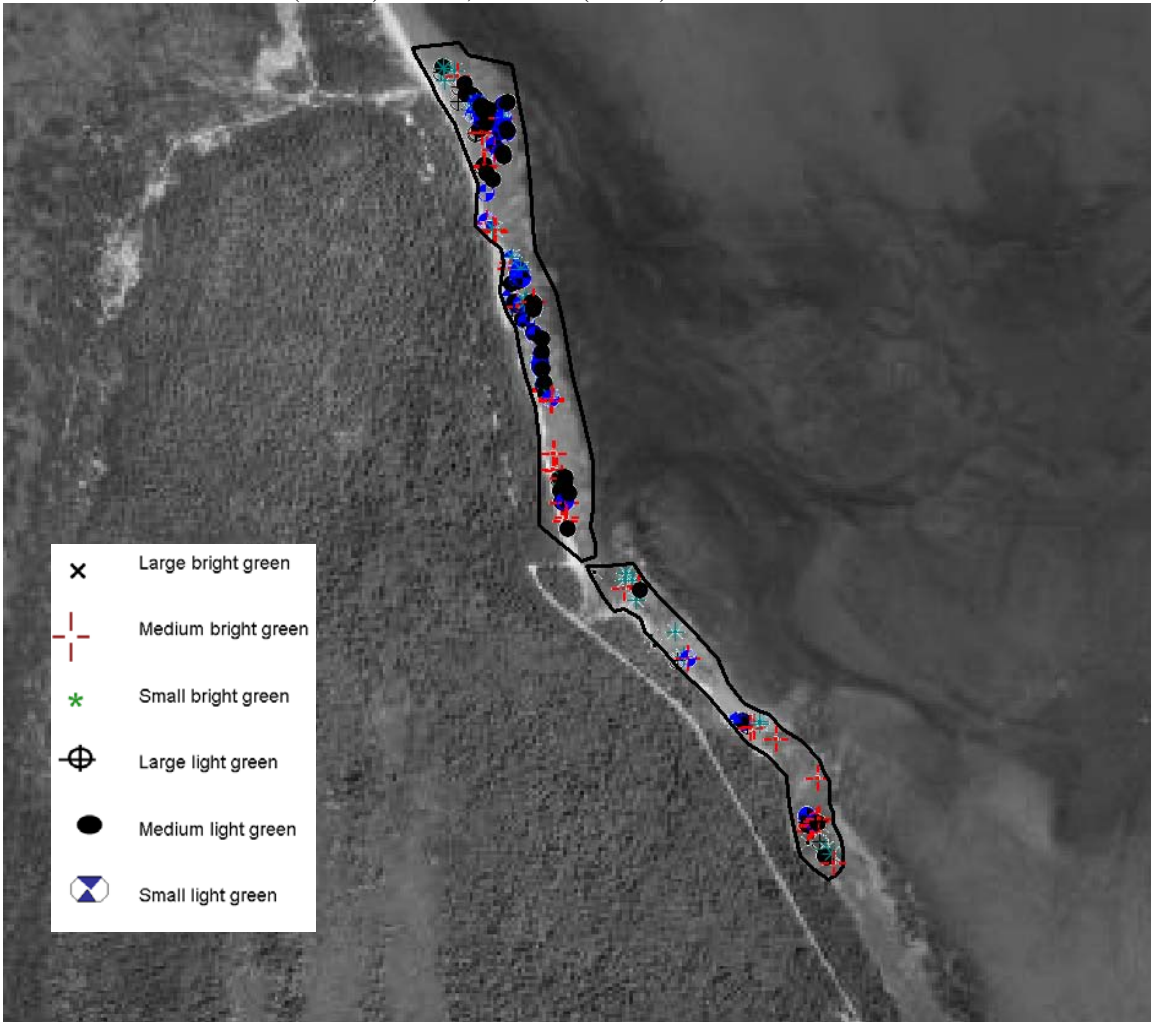
Porter Point

Total area walked: approx 208 acres



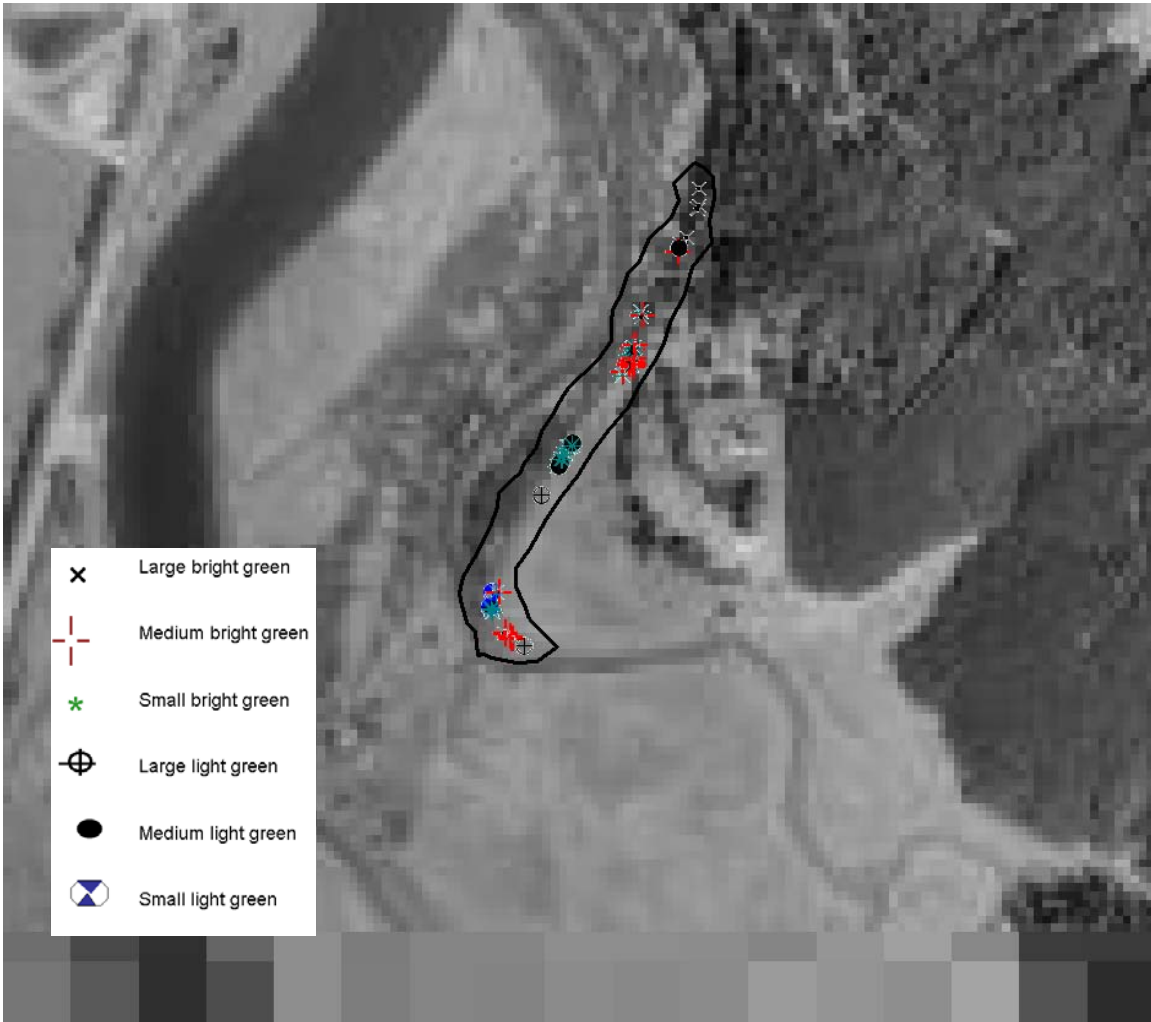
Leadbetter Point

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

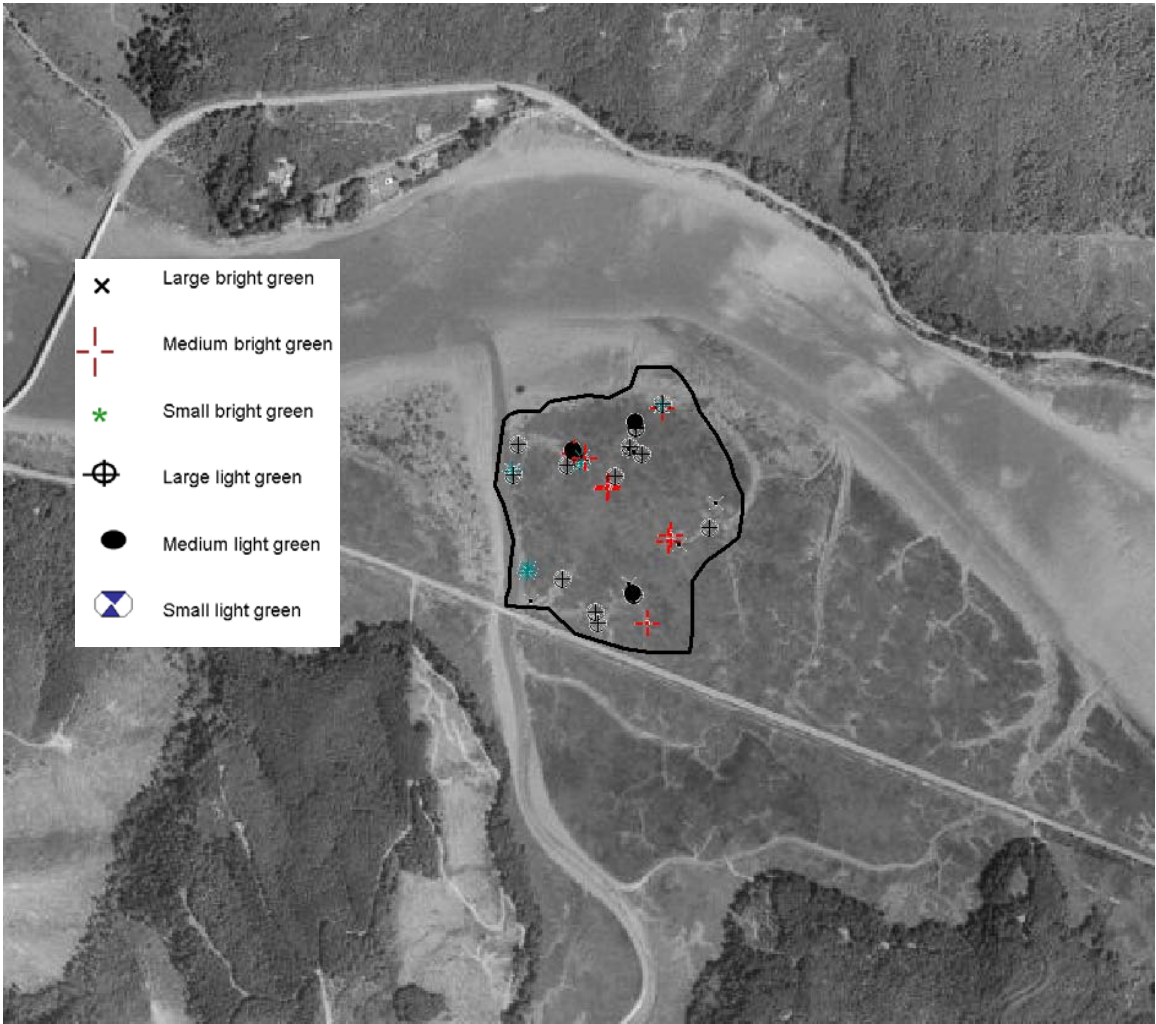


Palix River

Total area covered: 7 acres



Ellsworth Slough
Total area: 47 acres

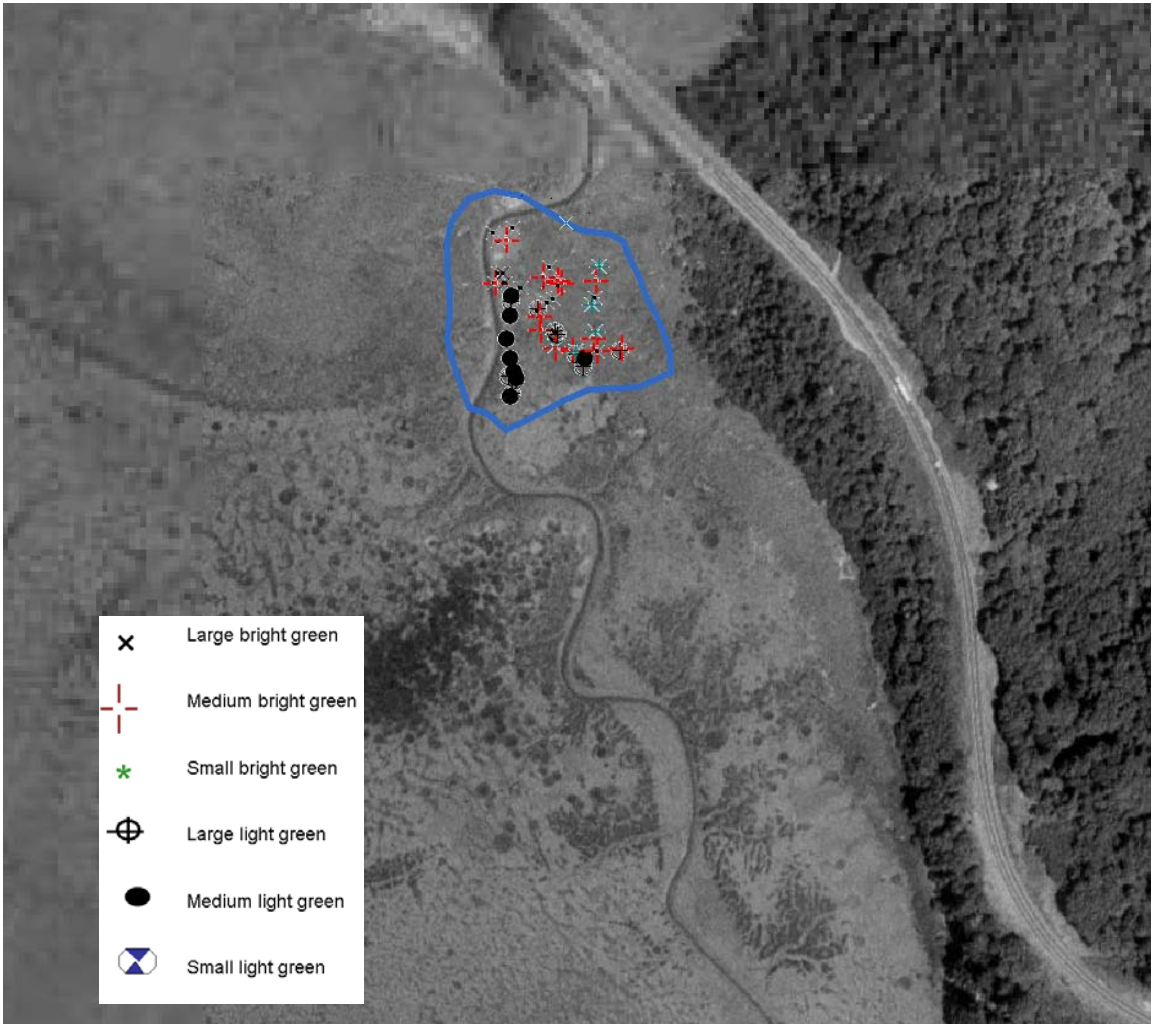


Willapa Slough

Total area covered: 4 acres



North Willapa Meadow
Total area covered: 5 acres



Tokeland

Total area covered: 14 acres.

