

Castilleja levisecta Global Population Estimates

Joe Arnett, Washington Natural Heritage Program, December 10, 2014

Summary of 2014 statistics: The total global population of *C. levisecta*, now estimated at 186,411 flowering individuals, continues to rise, and this increase is because of the increasing success of outplantings. The 12 extant wild populations include 13,337 plants, which is the lowest wild population count in the past ten years and accounts for only 7 percent of the global population. The 32 extant plantings (including 4 augmentation plantings) total 173,074 plants, 93 percent of known *C. levisecta* plants. Of these, 170,254 meet the time criterion proposed by the species technical team. The number of outplants first exceeded the number of wild plants in 2012. Currently 14 locations have over 1,000 plants that meet recovery criteria. In 2012 this number was 10; in 2011 it was 4.

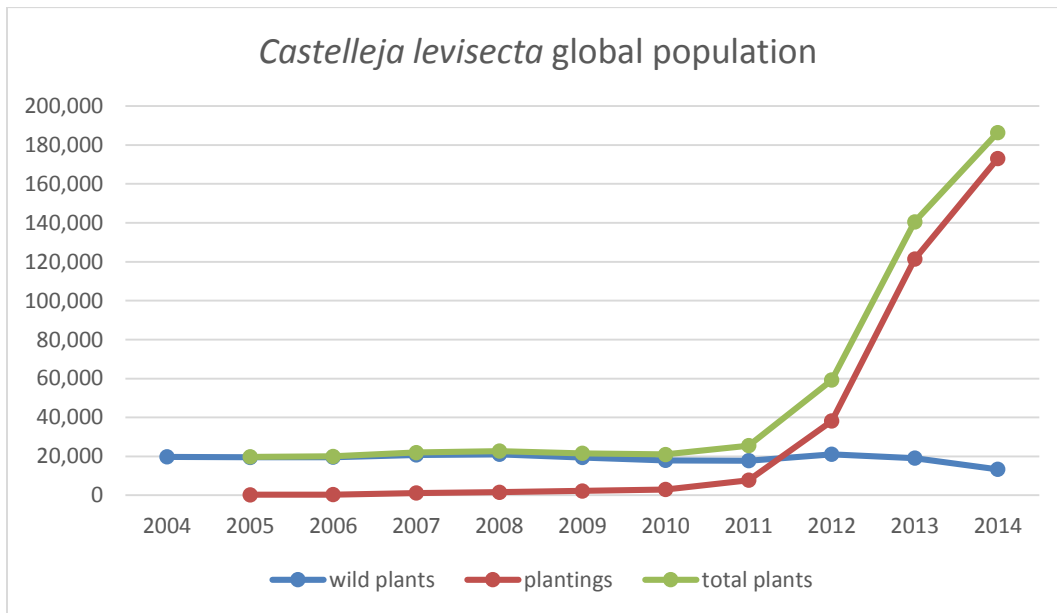


Figure 1. Graph of global sums of all population counts (wild, planted, and total) for *Castilleja levisecta* between 2004 and 2014. Data are presented below in Table 1. This graph includes extrapolated estimates of wild populations for years in which census was not made in order to generate the best available annual estimate of total population of the species (see Table 4).

Table 1. Global summary of wild and planted <i>Castilleja levisecta</i>, 2004-2014. In order to estimate total annual populations, when all populations are not monitored annually, this table includes extrapolated data shown in Table 4.											
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
wild plants	19,746	19,521	19,604	20,769	21,087	19,391	17,991	17,777	21,037	19,097	13,337
plantings		262	372	1,187	1,608	2,215	2,970	7,725	38,184	121,417	173,074
total plants		19,783	19,976	21,956	22,695	21,606	20,961	25,502	59,221	140,514	186,411

Table 2. *Castilleja levisecta* plantings and wild populations, 2010-2014. This table summarizes wild plants and outplants that meet recovery criteria.

Location	State	year					
		2010	2011	2012	2013	2014	5-yr average
Glacial Heritage Preserve	WA	97	3,016	11,141	88,054	134,098	47,281
Rocky Prairie NAP	WA	7,252	6,183	8,910	7,240	5,569	7,031
Whidbey Island, Smith Prairie, Pacific Rim Institute (Au Sable)	WA	188	1,358	12,250	9,106	5,291	5,639
Trial Island* (2013)	BC	2,777	2,673	2,569	2,465	2,465	2,590
Whidbey Island, Hill Road	WA	1,487	1,984	2,656	4,612	2,191	2,586
San Juan Island, San Juan Valley	WA	3,816	3,196	2,576	1,956	1,336	2,576
Baskett Slough NWR, Baskett Butte East	OR	0	0	0	3,575	7,347	2,184
Whidbey Island, Naas/Admiralty Inlet Preserve	WA	1,007	1,714	2,783	1,920	2,987	2,082
West Rocky Prairie	WA	91	84	2,353	3,201	6,380	2,422
Ft. Casey	WA	1,708	2,881	2,936	1,428	364	1,863
Whidbey Island, Ebey's Landing	WA	0	0	1,739	4,308	3,149	1,839
Bezell Memorial Forest, Benton County	OR	0	74	2,688	3,233	1,647	1,528
Wolf Haven	WA	32		249	1,349	2,970	1,150
Morgan/ Tenalquot	WA	89	108	1,029	619	1,677	704
San Juan Island, False Bay	WA	866	545	258	346	374	478
Cardwell Hill, Benton County Preserve	OR			317	678	262	419
Finley NWR, Field 29	OR	0	2	40	1,128	745	383
Mima Mounds Natural Area Preserve	WA	78	216	313	347	749	341
Lupine Meadows Preserve	OR			186	550	281	339
Fern Ridge, ACOE, Fern Ridge Res.	OR	0	0	0	172	1,188	272
Baskett Slough NWR, Baskett Butte West	OR		136	142	132	513	231
Finley NWR, Pigeon Butte	OR			24	276	361	220
Whidbey Island, Forbes Point	WA	270	78	170	192	294	201
Alpha Islet* (2006)	BC	165	165	165	165	165	165
Finley NWR, Bellfountain Prairie	OR	0	0	1	140	659	160
Long Island* (2002)	WA	154	154	154	154	154	154
Scatter Creek south	WA	156	129	117	25	83	102
Whidbey Island, SPU Bluff	WA	80	71	67	103	109	86
Fitton Green, Benton County	OR				38	86	62
Waldron Island, Pt. Disney, Bitte Baer Preserve	WA	22	24	81	87	78	58
Whidbey Island, West Beach	WA					18	18
Kah Tai prairie, Port Townsend	WA					1	1
Totals by year		20,335	24,791	55,914	137,599	183,591	

Table 3. *Castilleja levisecta* species-wide population summary. Numbers are flowering plants. Outplants applicable to recovery are those grown on site from seed, from a plug persisting on the site for 3 or more years, or reproduction from plantings.

Location	State	2014 flowering plants			
		outplants	outplants applicable to recovery	naturally occurring plants	applicable to recovery in 2014
Glacial Heritage Preserve	WA	134,144	134,098	0	134,098
Baskett Slough NWR, Baskett Butte East	OR	7,940	7,347	0	7,347
West Rocky Prairie	WA	6,633	6,380	0	6,380
Rocky Prairie NAP	WA	0	0	5,569	5,569
Whidbey Island, Smith Prairie, Pacific Rim Institute (Au Sable)	WA	5,291	5,291	0	5,291
Whidbey Island, Ebey's Landing	WA	3,149	3,149	0	3,149
Whidbey Island, Naas/Admiralty Inlet Preserve	WA	2,329	2,329	658	2,987
Wolf Haven	WA	2,970	2,970	0	2,970
Trial Island* (2013)	BC	0	0	2,465	2,465
Whidbey Island, Ebey's Landing Hill Road	WA	0	0	2,191	2,191
Morgan/ Tenalquot	WA	1,822	1,677	0	1,677
Bezell Memorial Forest, Benton County	OR	1,756	1,647	0	1,647
San Juan Island, San Juan Valley	WA	0	0	1,336	1,336
Fern Ridge, ACOE, Fern Ridge Res.	OR	1,215	1,188	0	1,188
Mima Mounds Natural Area Preserve	WA	832	749	0	749
Finley NWR, Field 29	OR	887	745	0	745
Finley NWR, Bellfountain Prairie	OR	973	659	0	659
Baskett Slough NWR, Baskett Butte West	OR	527	513	0	513
San Juan Island, False Bay	WA	68	37	337	374
Whidbey Island, Fort Casey	WA	137	137	227	364
Finley NWR, Pigeon Butte	OR	411	361	0	361
Whidbey Island, Forbes Point	WA	186	186	108	294
Lupine Meadows Preserve	OR	390	281	0	281
Cardwell Hill, Benton County Preserve	OR	660	262	0	262
Alpha Islet* (2006)	BC	0	0	165	165
Long Island* (2002)	WA	0	0	154	154
Whidbey Island, SPU Bluff	WA	0	0	109	109
Fitton Green, Benton County	OR	113	86	0	86
Scatter Creek south	WA	83	83	0	83
Waldron Island, Pt. Disney, Bitte Baer Preserve	WA	118	78	0	78
Whidbey Island, West Beach	WA	0	0	18	18
Kah Tai prairie, Port Townsend	WA	1	1	0	1
Outplantings (8) in BC, OR, and WA not yet meeting recovery criteria		439	0	0	0
Totals		173,074	170,254	13,337	183,591
Grand total including plants not yet applicable to recovery					186,411
*estimates based on the most recent monitoring (year in parentheses)					

Table 4. Actual and extrapolated (red font) counts for all known wild *Castilleja levisecta* populations between 2004 and 2014. Extrapolations were made to estimate populations for years in which census was not made in order to generate the best available annual estimate of the total population of the species. Values for skipped years are incremental averages of bracketing years.

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Rocky Prairie	6,535	7,056	7,834	8,613	9,392	8,322	7,252	6,183	8,910	7,240	5,569
Naas/Admiralty Inlet	59	120	94	86	148	241	274	347	1,128	841	658
SPU Bluff	80	80	80	80	80	80	80	71	67	103	109
Ft. Casey	235	260	760	1,544	1,713	1,497	1,538	2,471	2,534	1,196	227
West Beach	82	130	189	69	97	75	47	65	20	14	18
Ebey's Landing	2,057	669	214	747	601	1,044	1,487	1,984	2,656	4,612	2,191
Forbes Point	532	123	260	105	201	56	50	18	54	84	108
False Bay middle	50	50	54	40	42	33	32	20	11	22	16
False Bay south	256	284	312	401	453	407	319	430	193	245	321
Long Island	154	154	154	154	154	154	154	154	154	154	154
San Juan Valley	7,036	6,916	6,296	5,676	5,056	4,436	3,816	3,196	2,576	1,956	1,336
Trial Island	2,670	2,930	3,192	3,089	2,985	2,881	2,777	2,673	2,569	2,465	2,465
Alpha Islet	1,333	749	165	165	165	165	165	165	165	165	165
Totals	19,746	19,521	19,604	20,769	21,087	19,391	17,991	17,777	21,037	19,097	13,337

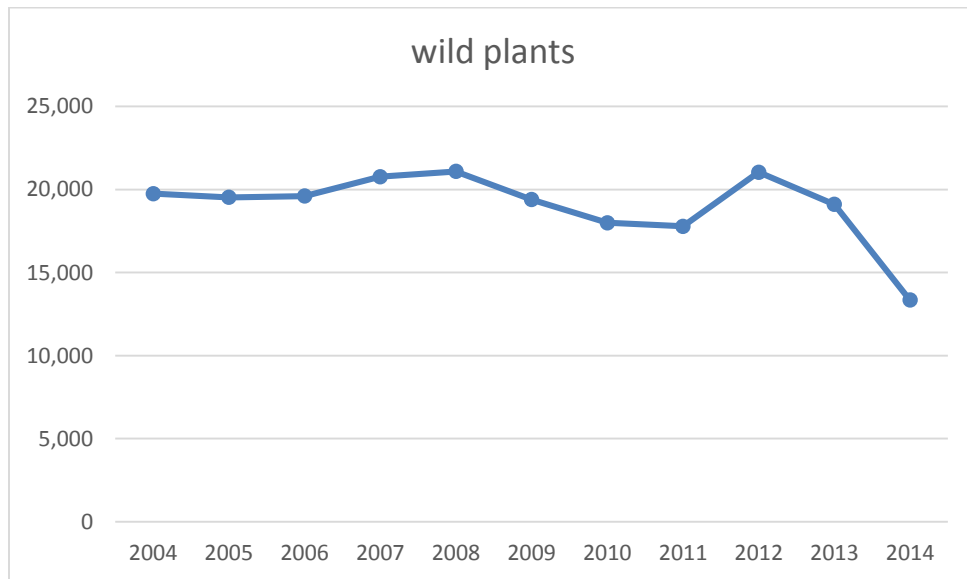


Figure 2. Totals of all known wild *Castilleja levisecta* plants. This is an expanded view of the same data presented in Figure 1 and Table 1.

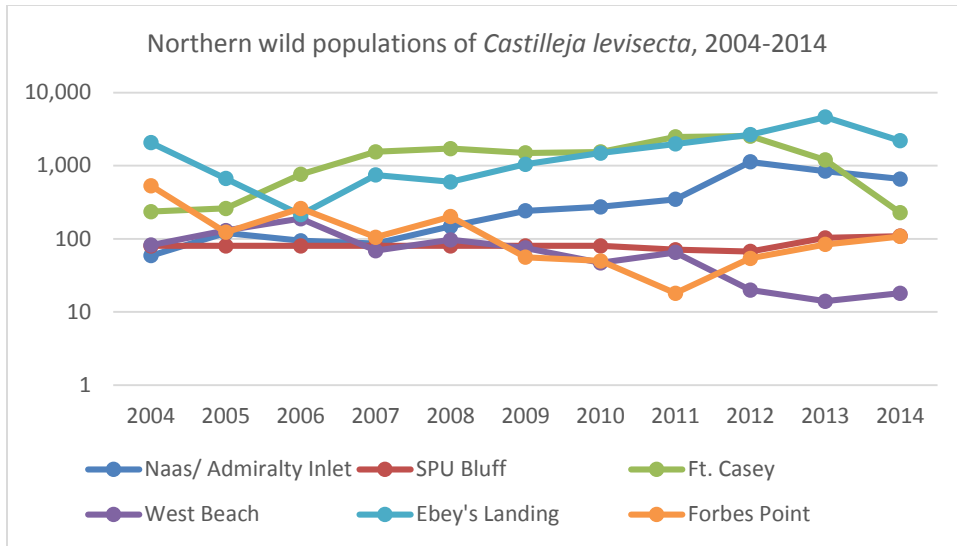


Figure 3. Northern wild populations of *Castilleja levisecta*. The drop at Ebey's Landing prior to 2006 was due to a July wildfire that killed many plants and possibly may also be due to a portion of the population slumping off. This graph includes the extrapolated data from Table 4.