

**Visual Observations and Demographic Monitoring Results for
Northern Wormwood (*Artemisia borealis* var. *wormskioldii*)
Summary Report - 2015**

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For:

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November 6, 2015

Summary

The Public Utility District No. 2 of Grant County, Washington (Grant PUD) has been conducting visual observations and demographic monitoring of northern wormwood (*Artemisia borealis* var. *wormskioldii*; NW) population located near Beverly, Washington since 2000 (Table 1). Census data for this population of NW indicates variability in number of seedlings and flowering plants from year to year (Table 1).

Over the observation timeframe a decrease in the number of flowering plants within the monitoring plots has been documented, while census data for seedling and ambiguous indicate a substantial increase. For example, annual census data for the main NW population in 2015 was estimated at 267 flowering plants, which was a decrease in population size from 326 flowering plants in 2014 (Table 1).

In 2015, Grant PUD monitored all established plots (n=31 plots), and a total of 20 flowering plants were documented (Wormskioldii's northern wormwood) and 360 seedlings of *Artemisia campestris*. Currently, 5,707 individual *Artemisia campestris* species are being monitored within the 31 plots.

During 2015, Grant PUD continued noxious weed control efforts. This included manual removal (hand pulling) of diffuse knapweed. In addition, Grant PUD worked with Washington State University to implement biological control using insects on Dalmatian toadflax within the Beverly population. It appears through visual observations in recent years that through aggressive weed control, Grant PUD has improved habitat conditions for northern wormwood within the Beverly Island Complex.

Table 1. Census data for seedlings of *Artemisia campestris* and flowering northern wormwood plants for years 2000 through 2015 at specific locations at Beverly population.

Year	Seedlings*	Population via census*	Population max	NWW Adults flowering in plots*	Hawk pole population	Northern Peninsula population
2000		1,260	1,260			
2001	6			225		
2002	563			200		
2003	1,610			198		
2004	211			109		
2005	139	1,623-1,710	1710	92	44	111
2006	555			104		
2007	91	1,585-1,656	1656	73	52	100
2008	44	1022-1084	1084	66		
2009	2,659	763-764	764	54	5	33
2010	1,016	401-405	405	23	5	21
2011	4,031	350-352	352			
2012	6,393	424-441	441	28	8	8
2013	3,791	532-552	552	36	16	2
2014	843	317-326	326	22	14	5
2015	360	254-267	267	20	12	1

* These are part of the main population where demographic monitoring occurs annually

Grant PUD has provided this survey and census information to Tom Kaye at the Institute for Applied Ecology at Corvallis, Oregon for further population viability analysis. The final population viability analysis will be completed in 2018.

Grant PUD will continue annual demographic monitoring, annual census surveys, weed control efforts, as well as exclude vehicle access to the site via fencing. Grant PUD will also continue to collect and provide seeds when requested to Kelly Amsberry, Native Plant Conservation Program, Oregon Department of Agriculture. This seed collection effort has been used to propagate surrogate *Wormskioldii*'s northern wormwood populations downriver near The Dalles, OR.