



Lemhi Penstemon and Spotted Knapweed Monitoring

Big Hole National Battlefield



Why are Lemhi penstemon and Spotted knapweed important?

Lemhi penstemon (*Penstemon lemhiensis*) is a short-lived perennial flowering plant that is endemic to Lemhi County in eastern Idaho and 4 counties in southwest Montana, including Beaverhead County where Big Hole National Battlefield (BIHO) is located. Over 50% of known populations are made up of 30 plants or less and there are only three large populations known with over 300 plants. Results of inventory and monitoring efforts from 2009-2014 confirm the population at the battlefield to be the largest reported of the species, making Big Hole National Battlefield a crucial place for Lemhi penstemon conservation. Lemhi penstemon is listed as a sensitive species and is ranked as at risk of extinction due to habitat loss from invasion of spotted knapweed (*Centaurea stoebe* L.) and from altered fire regimes. Seedlings requires bare soil microsites to become established and prescribed burning may be effective in stimulating germination and population growth. In the absence of fire, other vegetation may compete for resources and occupy potential germination sites.

Why do we monitor lemhi penstemon?

- To provide status and long-term trends of the total number of established lemhi penstemon and spotted knapweed plants
- To detect changes in the lemhi penstemon population (e.g., number of seedlings, plant establishment, survival of mature plants)

How do we use the monitoring data?

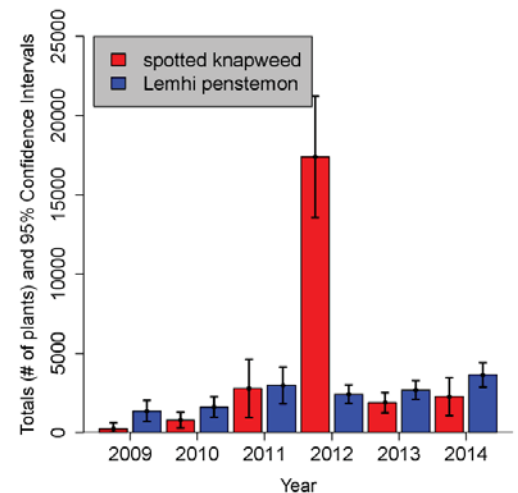
- To assist park management with restoration decision-making, including guiding potential management options, such as prescribed fire
- To enable park managers to avoid critical penstemon habitat during management activities, such as herbicide application
- To support park resource planning and land health reporting efforts

What have we found?

Results of monitoring for the past 6 years have shown an increase in the Lemhi penstemon populations on both study sites (Horse Pasture and Howitzer Hill). Additionally, the invasive spotted knapweed population has shown a dramatic reduction in recent years following a 2012 spike on the Horse Pasture, presumed to be a result of successful treatments with herbicide. Information provided by monitoring efforts also assisted the park's management decision to conduct a prescribed fire at Howitzer Hill in the Fall of 2014. The main goals of this burn are to help maintain the cultural landscape of the Battlefield and mimic the historic role of fire on the mountain slope while helping native vegetation, such as Lemhi penstemon thrive.



Above: Lemhi penstemon (*Penstemon lemhiensis*) plant below BIHO visitor center. Left: Lemhi penstemon seedling. Right: Spotted Knapweed (*Centaurea stoebe* L.)



Population estimates for spotted knapweed and lemhi penstemon plants on the Howitzer Hill and Horse Pasture hillslope study areas of BIHO, 2009-2014.