

# Population Age Structure for Sickle Saltbush and Winterfat in the Catlow Valley of Oregon

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## Introduction

Little is known of the longevity or population age structure of the many shrub species within the Great Basin of North America. A better understanding of shrub lifespan and population age structure can better help land managers determine shrub population dynamics and the stability of the plant communities to which these shrubs belong.

## Aims

To determine the lifespan and population age structure of sickle saltbush (*Atriplex falcata* [M.E. Jones] Standl.) and winterfat (*Krascheninnikovia lanata* [Pursh] A.D.J. Meeuse & Smit) in the Catlow Valley of Oregon across a Silty 6-10 PZ Ecological Site.

To determine the association between stem circumference and shrub age for both sickle saltbush and winterfat.

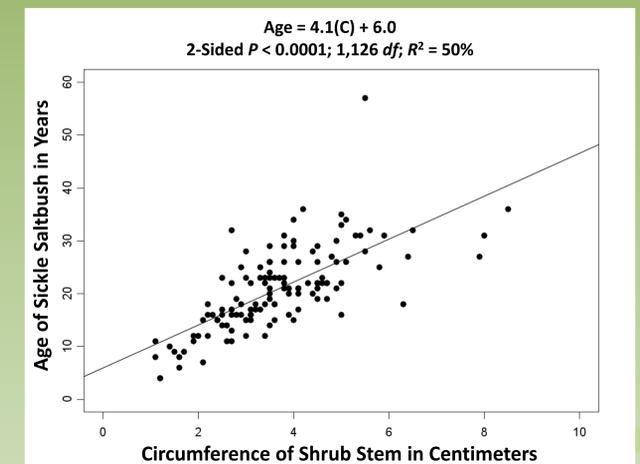
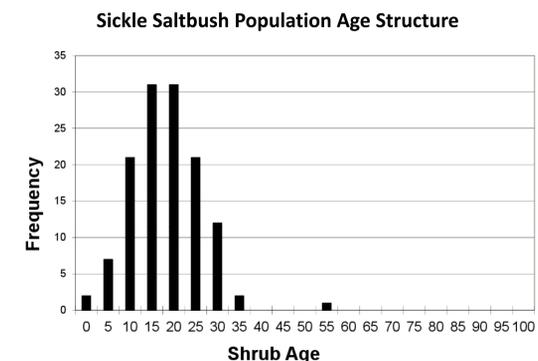
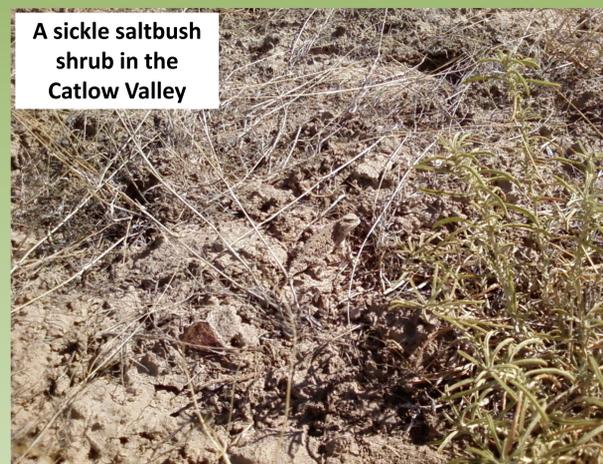
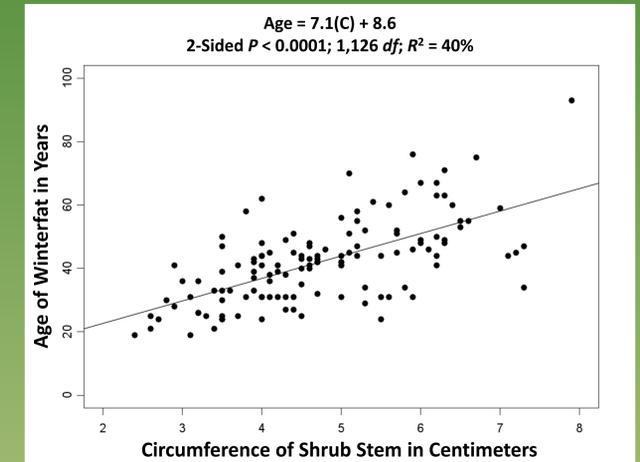
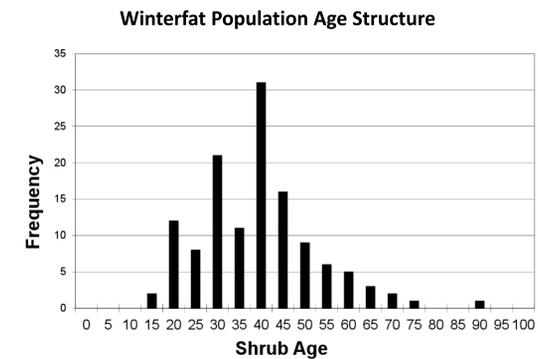
## Methods

In 2007, eight shrubs of winterfat and sickle saltbush were collected at 16 locations,  $n = 128$  for each species. Shrub age was estimated by counting annuli along the cross-section of the stem at the point of the root crown (Schweingruber and Poschlod 2005). At the same point, shrub circumference was measured to the nearest millimeter. After shrubs were determined for age, frequency histograms were created for each species based on ten year increments in order to establish a visual estimate of population age structure. Lastly, association between shrub age and stem circumference were tested for each species using simple linear regression.

## Results

We found that on average winterfat shrubs were 21 years older than sickle saltbush. The youngest shrubs sampled were 19 years of age for winterfat and 4 years of age for sickle saltbush. Overall, winterfat had a longer lifespan than saltbush, with winterfat demonstrating little to no recruitment from 1987 to 2007. Sickle saltbush had a much shorter lifespan and more frequent recruitment from 1987 to 2007.

Circumference was found to be linked to shrub age for both winterfat and sickle saltbush. For every 1 cm increase in winterfat stem circumference there was an associated average increase in shrub age of 7.1 years (2-sided  $P < 0.0001$ ). The 95% confidence interval (CI) for this estimate was 5.6 to 8.6 years. Similarly, for every 1 cm increase in sickle saltbush stem circumference there was an associated average increase in shrub age of 4.1 years (2-sided  $P < 0.0001$ ; CI = 3.3 to 4.8 years).



## Summary

The lifespan of winterfat and sickle saltbush are greatly different in the Catlow Valley. The lifespan of winterfat appears to be about twice as long as sickle saltbush. Alternatively, our findings suggest that the lateral growth rate of sickle saltbush is nearly twice that of winterfat. This finding suggests that winterfat and sickle saltbush plants of similar stem diameter are likely to differ in age by a factor of two, winterfat being twice as old as sickle saltbush. Lastly, examination of population age structure suggests that recruitment of winterfat on the Silty 6-10 PZ ecological site is infrequent and episodic. In contrast, the recruitment of sickle saltbush is much more frequent and stable.

## Acknowledgements

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## References

Schweingruber, F.H. and P. Poschlod. 2005. Growth Rings in Herbs and Shrubs: life span, age determination and stem anatomy. *Forest Snow and Landscape Research* 79(3): 195-300.