



## Mapping Medusahead Coverage Across the California Central Valley Using LANDSAT 7 Imagery

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Medusahead (Mh) is an invasive annual grass that infests rangelands in the Western United States. Medusahead has a delayed phenology compared to most other annual grasses and forbs and often produces a recalcitrant thatch layer that appears to eliminate other plant species and increase fire risk. Control of Mh could benefit greatly if the distribution of Mh within this region was better resolved and the factors related to Mh invasion across large regions were better understood. The delayed phenology of Mh may allow its detection at relatively high resolution using remote sensing imagery. We surveyed land use types and Mh density at 360-m<sup>2</sup> resolution within the Dunnigan Hills area (roughly 300 km<sup>2</sup> extent) in Yolo County, CA. Using a series of quadratic discriminant models, Mh coverage classes (<5, 5-40, or >40% absolute coverage) in the survey region were related to spectral data from Landsat 7 imagery. Models were validated using hold-out data. Most or least likely Mh coverage class could be predicted with 95% probability over roughly 75% of area classified as rangeland within the study area. We then extrapolated the Mh prediction models to the remainder of the California Central Valley and surrounding foothill regions. This indicated several centers of severe Mh infestation on the scale of 10<sup>7</sup>-10<sup>9</sup> m<sup>2</sup>. Reliability of the extrapolation was assessed from additional ground observations collected in about six other areas. Coupled with other data from our experimental activities, this information will be used to model the factors related to Mh spatio-temporal distribution.

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