

A global database of shrub encroachment effects on ecosystem structure and functioning

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Abstract. The encroachment of woody plants into grasslands, and the conversion of savannas and open woodlands into shrublands, has been widely reported during the past decade. Encroachment has generated considerable interest among ecologists worldwide, but there have been few quantitative syntheses of the effects of encroachment on ecosystem processes across large areas of the globe. Here we summarize the results of observations of the effects of encroachment by woody plants on 111 ecosystem response variables using data obtained from 1722 encroached–unencroached pairs, reported in 160 studies from North and South America, Africa, Europe, Australia, and Asia. We used an extensive review of the literature, including both published and unpublished data, to summarize available data on the effects of a change from open woodland or grassland to shrubland or closed woodland, on richness of plant and animal taxa, soil chemistry, and the status of the soil surface. Our database is restricted to arid, semi-arid, and dry sub-humid environments (drylands) receiving average annual rainfall between 850 and 200 mm. An analysis of the impacts of shrub encroachment on ecosystem structure and function has already been reported using a large subset of these data. This updated data set can provide an opportunity to test further hypotheses about the effects of encroachment on plant and animal communities and on soil processes related to ecosystem functioning.

Key words: *degradation; desertification; ecosystem processes; encroachment; invasion; shrub; shrubland; thickening; woody.*

The complete data sets corresponding to abstracts published in the Data Papers section of the journal are published electronically in *Ecological Archives* at <http://esapubs.org/archive> (the accession number for each Data Paper is given directly beneath the title).