

Fig. 1. Hobbs & Norton's pathways for a restored ecosystem (3). Restored ecosystems often experience subsequent decline due to budget constraints of restoration projects that only allow for short-term intensive exotic species weeding (4, 5).

Objective: Determine whether restored vernal pools with frontloaded weeding effort are resistant to exotic invasion in the long run

Hypothesis: After intensive weeding stops, exotics will invade from the upland grassland matrix into the pool edges.



Fig. 2. Vernal pool zones and quadrats

- **Experimental Design**
- abundance and diversity.
- Each pool was delineated into three zones (Fig. 2).
- Data collected (monthly): Species percent cover, species richness

Exotic Species Invasion in Restored Vernal Pools

linear regression and 95% confidence intervals.



transition (b) and upland (c) zones. Each point represents the average monthly exotic species richness in each pool during the growing season (Feb-May), shown with a linear/ regression and 95% confidence intervals.

• Seven restored vernal pools were monitored for exotic species The pools are 3-8 years old, and intensive weeding has stopped. • Within each zone in each pool, we placed three 1m² quadrats.

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Discussion

Our results are consistent with our hypothesis that exotics can encroach into restored vernal pools once short-term weeding stops (Figs. 3b, 3c, 4b, 4c).



Fig. 5. Common grassland exotics, such as Festuca perennis (right) and Polypogon monospeliensis (left), reinvaded the vernal pool upland and transition zones



Fig. 6. Central zone maintains low exotic cover and richness due to abiotic filters such as inundation (2)

Overall conclusion: Exotic species are able to reinvade upland and transition zones after short-term weeding has stopped.

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