A tale of two invaders: the dynamic history of pampas grass and jubata grass in California

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Goals for invasion ecology

- Predict identity of worst invaders
- Predict spread rates
- Predict extent and magnitude of impact
- Assess risk

Frustrating difficulties

- Humans significantly influence spread and patterns of propagule supply
- Humans alter native habitat
- These factors interact and can change over space and time

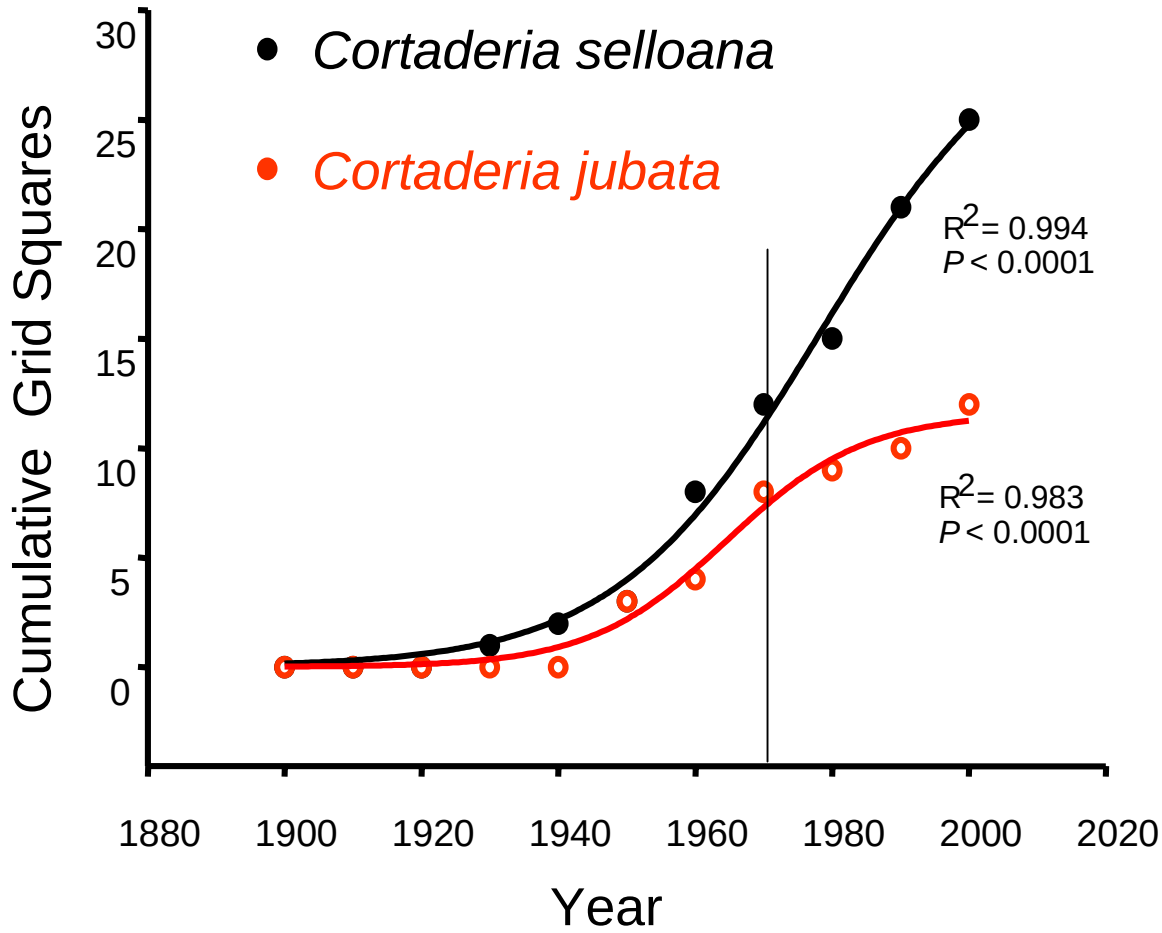
Particularly with ornamentals along the wild land-urban interface

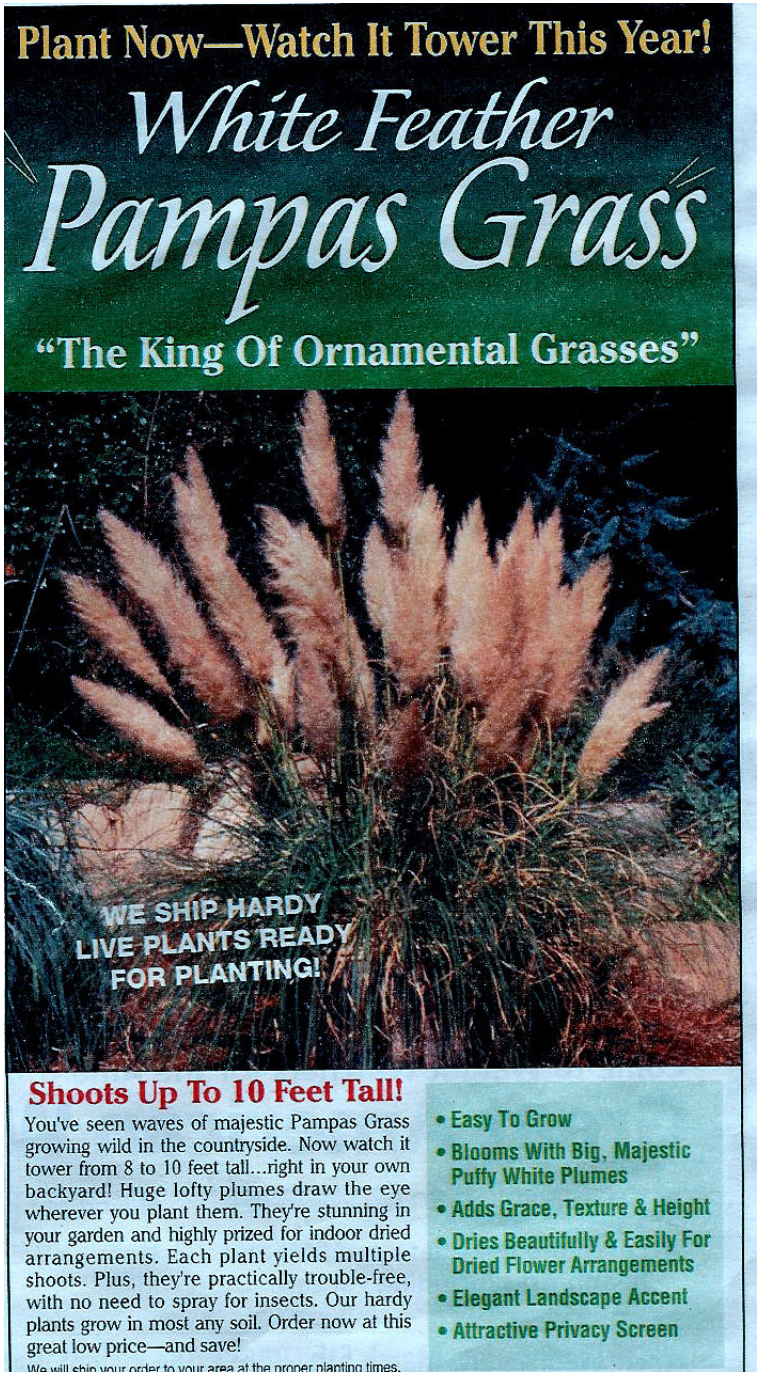
Invasive *Cortaderia* in California

C. jubata
apomictic asexual

C. selloana
sexual, dioecious

Expansion rate (areal extent) has been greater for *C. selloana*





Spread of ornamentals is due as much to marketing and distribution as innate biology

Cortaderia specimens first reach Europe in the 1830's

Kew Gardens, London

Benedict Roezl

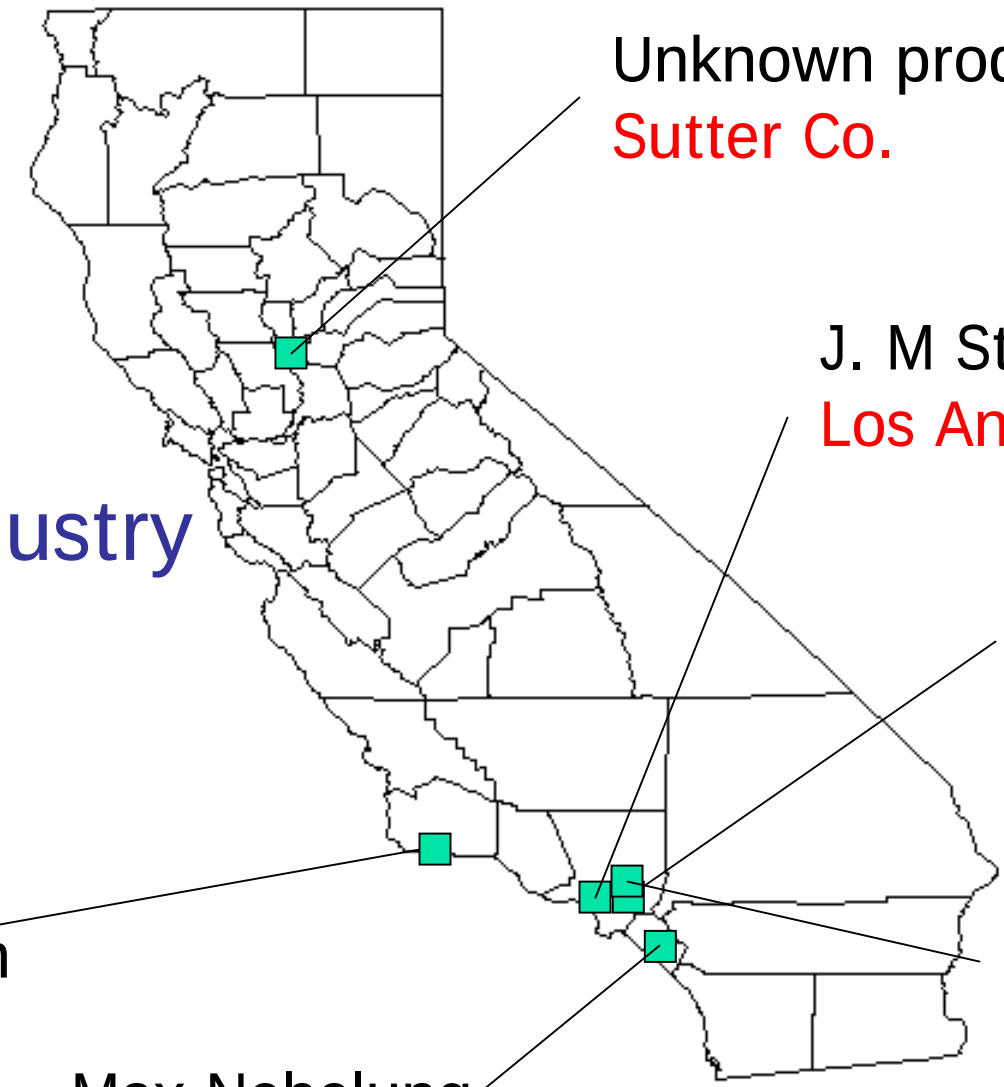
Colorado Springs, 1896

Rose Parade, 1896

Joseph Sexton
pampas grass pioneer

C. Selloana quickly dominated the plume and horticulture trade.

Plume industry of CA



Unknown producers
Sutter Co.

J. M Stewart
Los Angeles

W.C Hollman
Downey

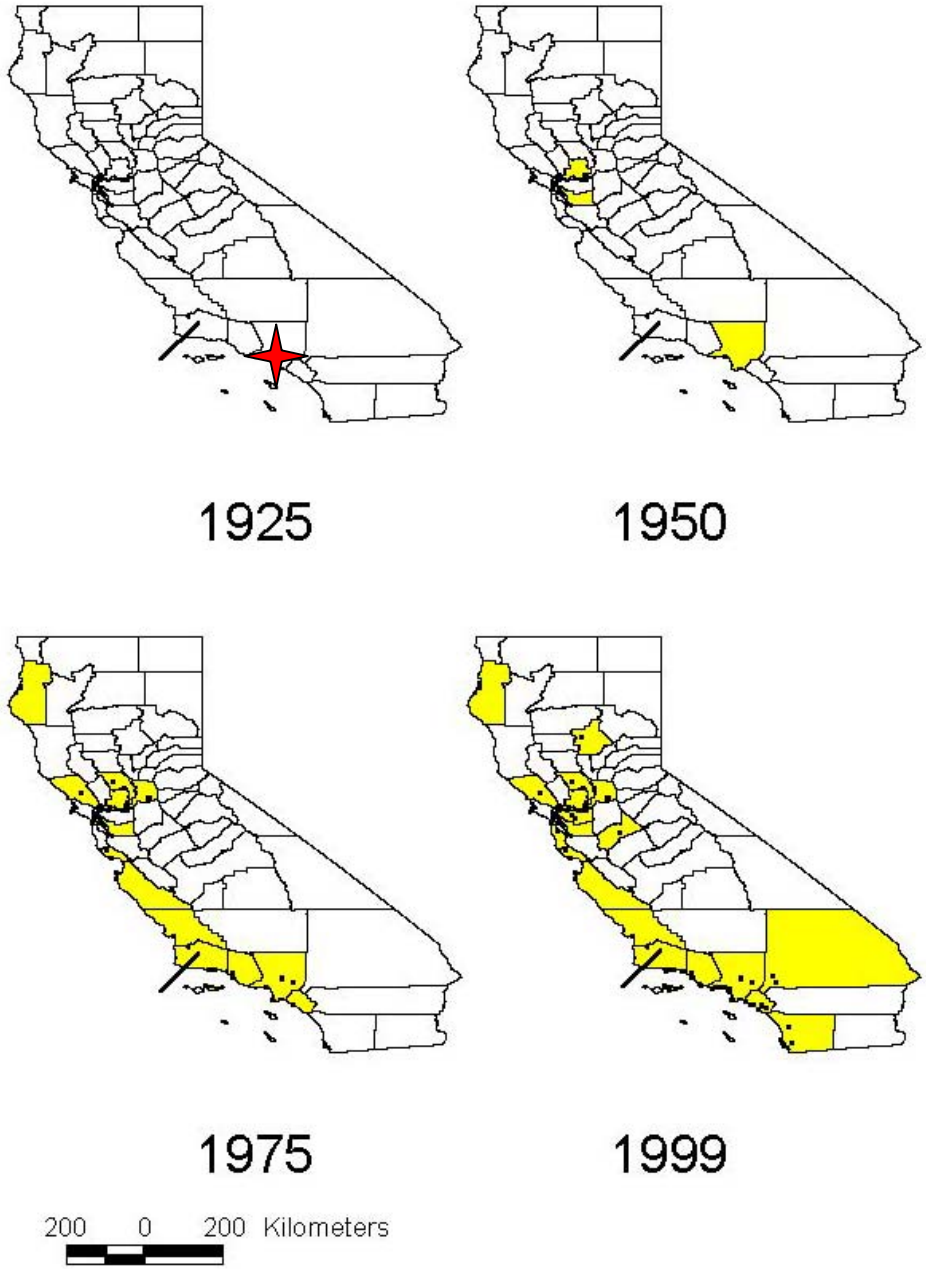
Harriet Strong
Whittier

Joseph Sexton
Goleta

Max Nebelung
Anaheim

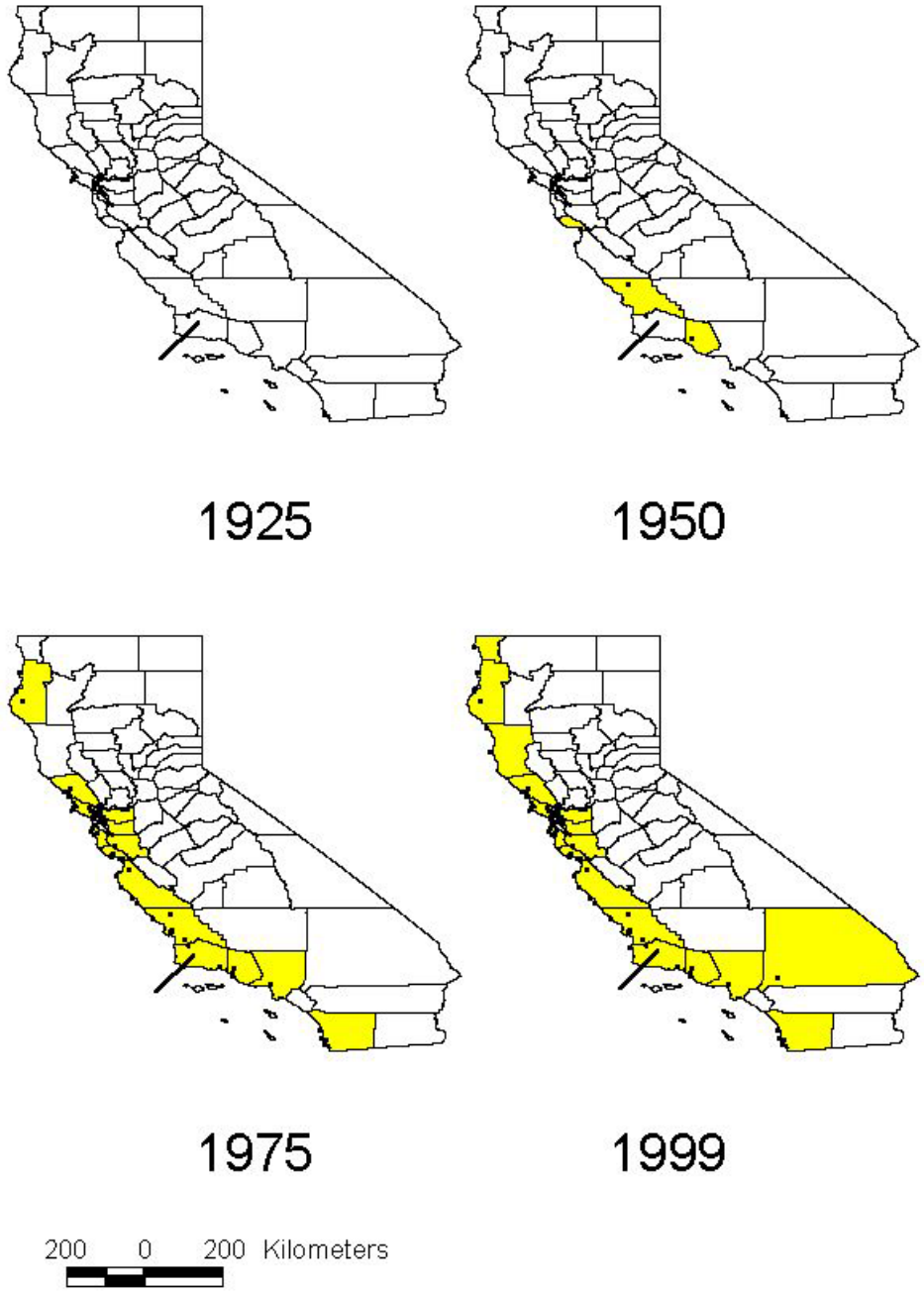
Cortaderia selloana

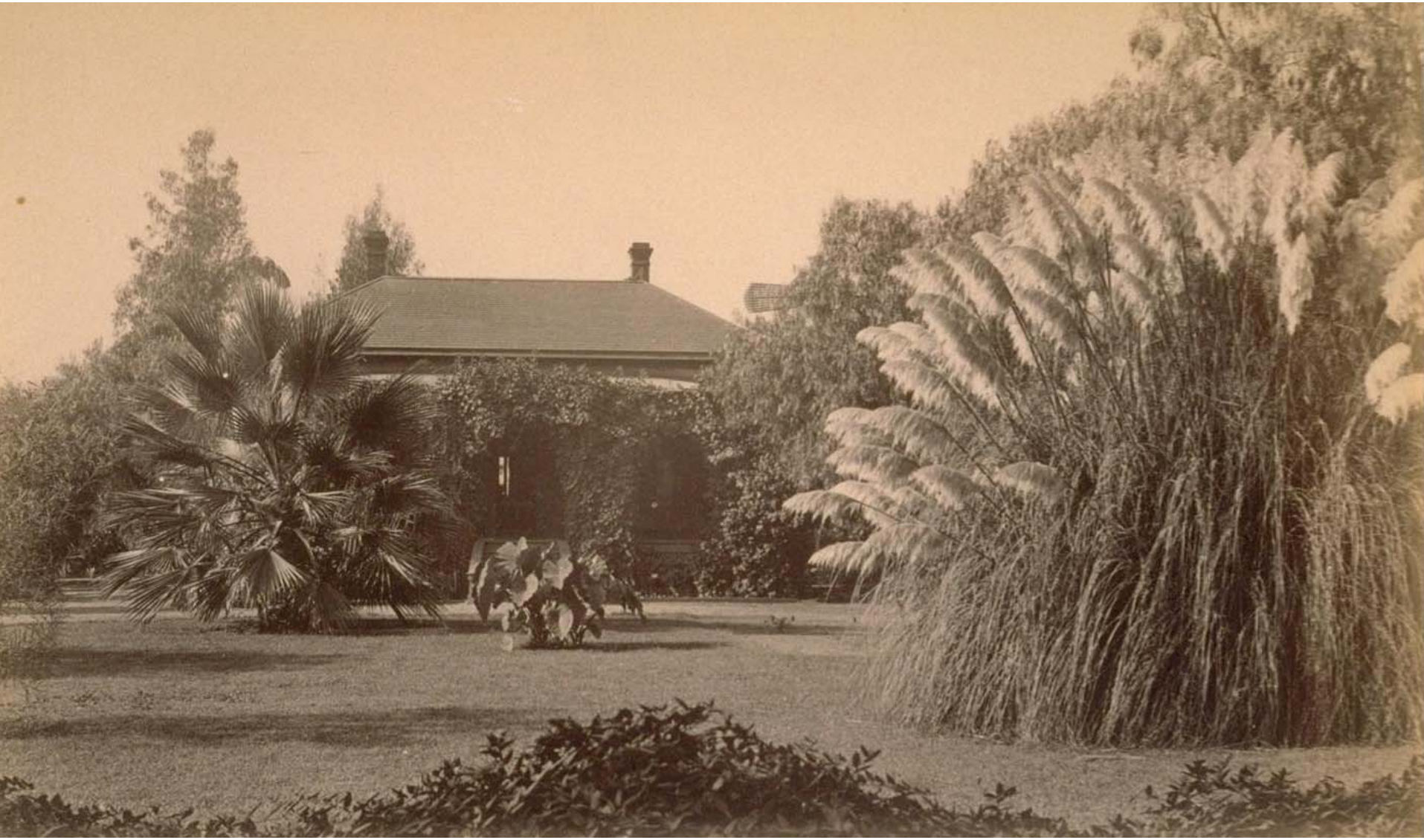
- Expanded from the two urban foci of Los Angles and San Francisco.
- Expansion has taken place inland as well as along the coast.
- Highest density of infestation in So. Cal.



Cortaderia jubata

- Expansion appears to have occurred in jumps.
- But limited almost entirely to a narrow coastal band.
- Highest density of infestation in No. Cal.



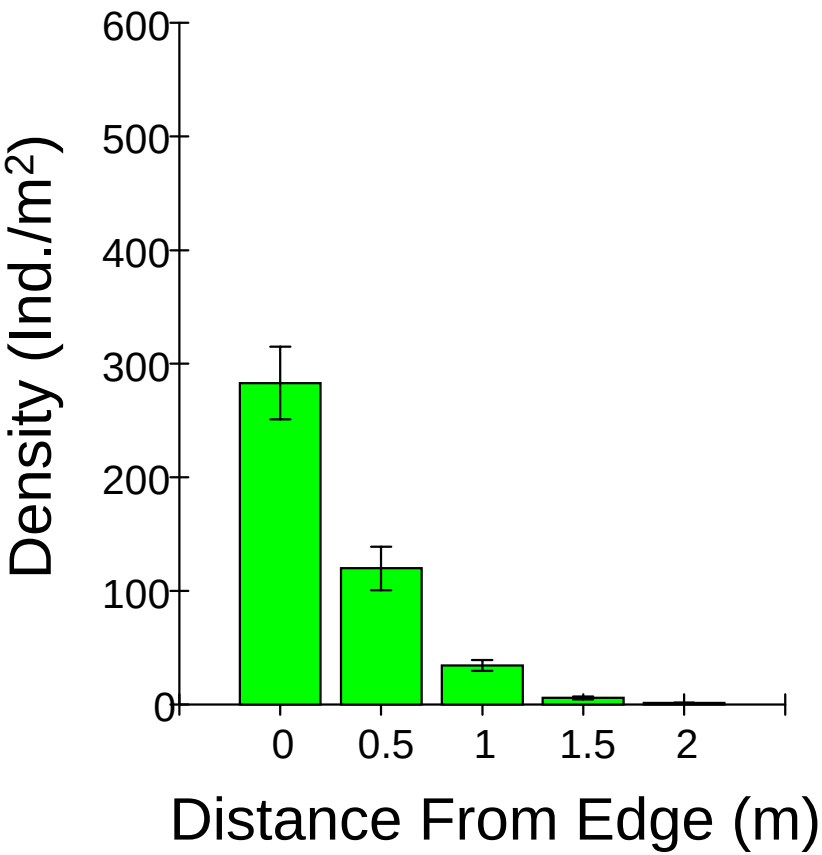


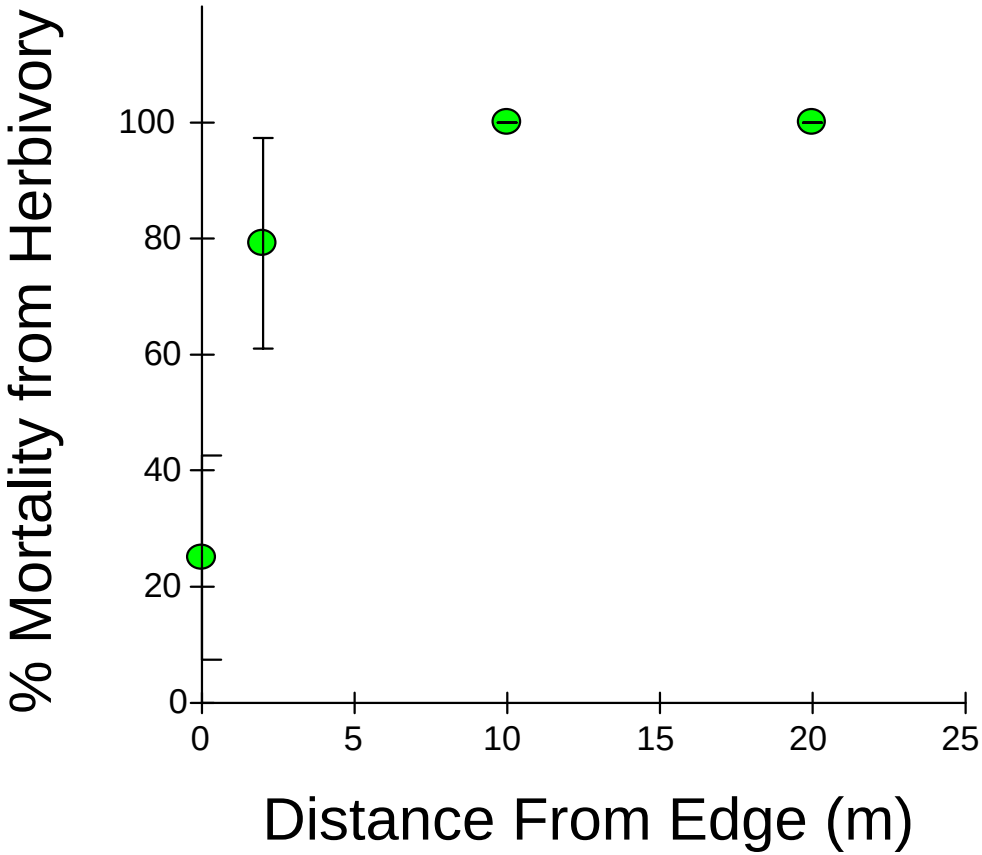
Los Angeles, 1887

Los Angeles, 1889

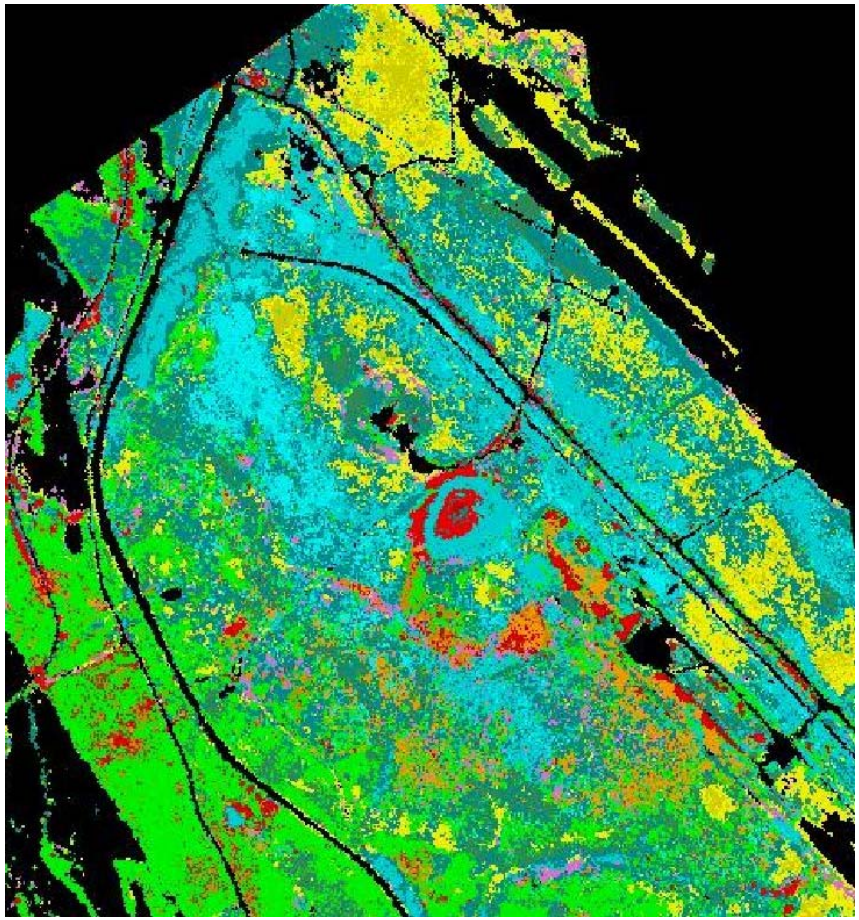
Santa Clara, 1880’s

Wild lands resist *Cortaderia* invasion





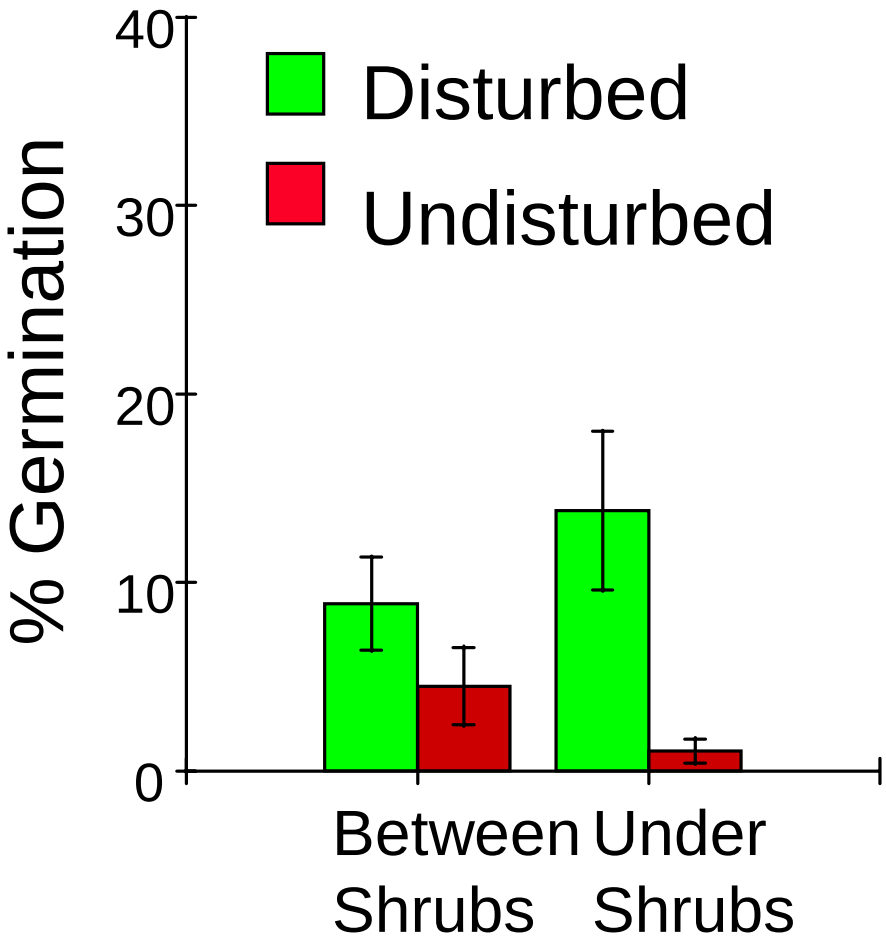
Vandenberg AFB



Courtesy CSTARS, UC Davis

But humans can compromise this resistance

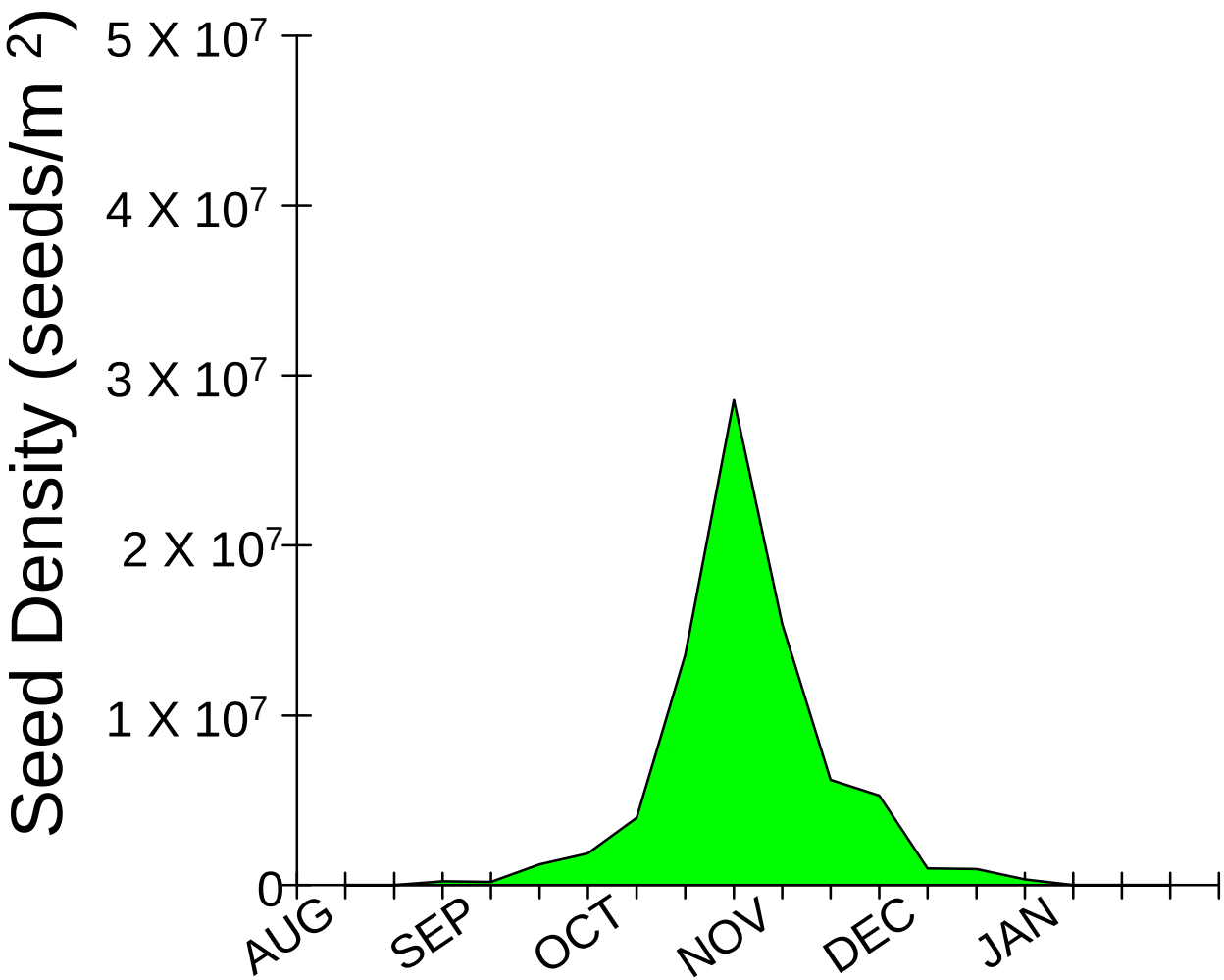
Disturbance



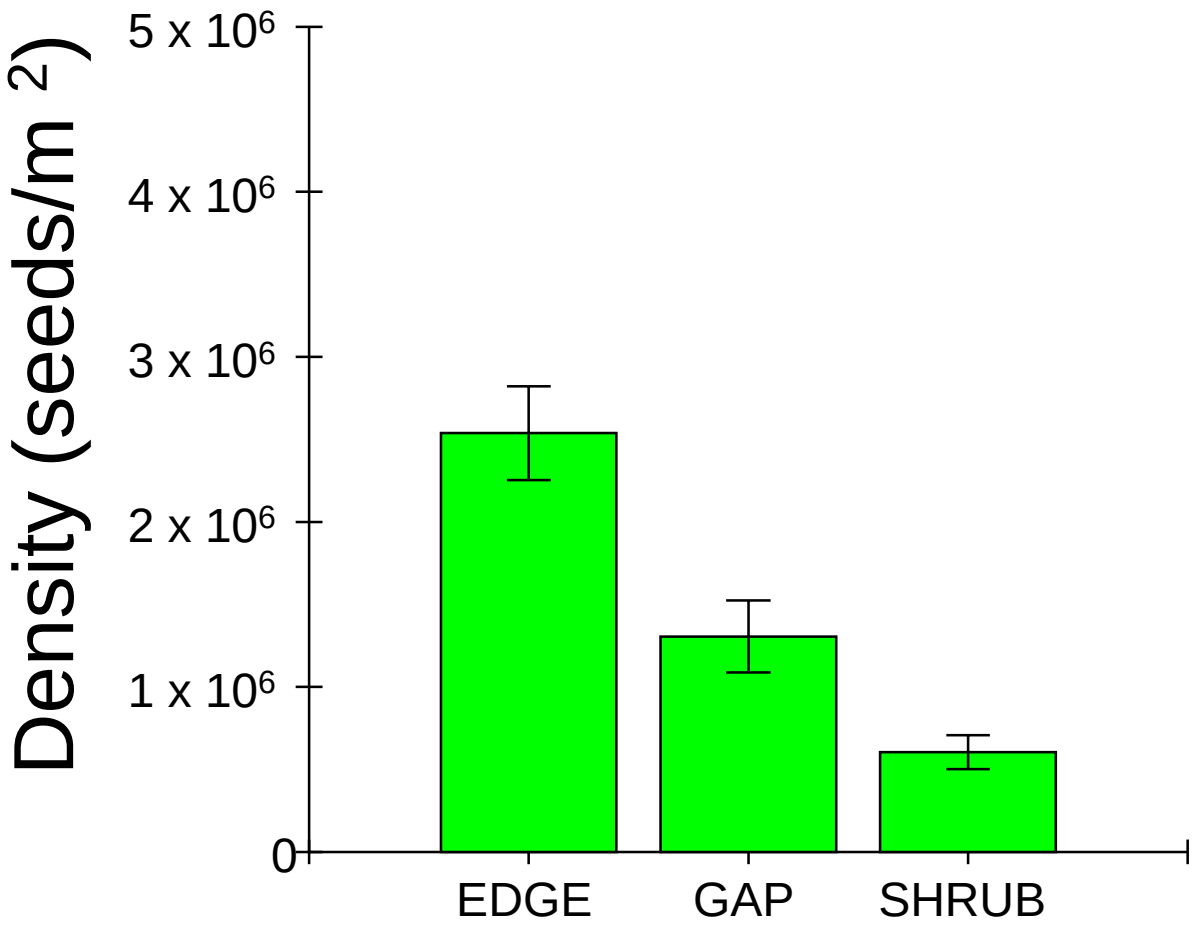
Other processes common on the W-U interface

- Fragmentation, edge formation, and corridor development
- Resource enrichment (nutrients, water)
- Increased stress (e.g. dust, ozone)
- Invasive propagule production

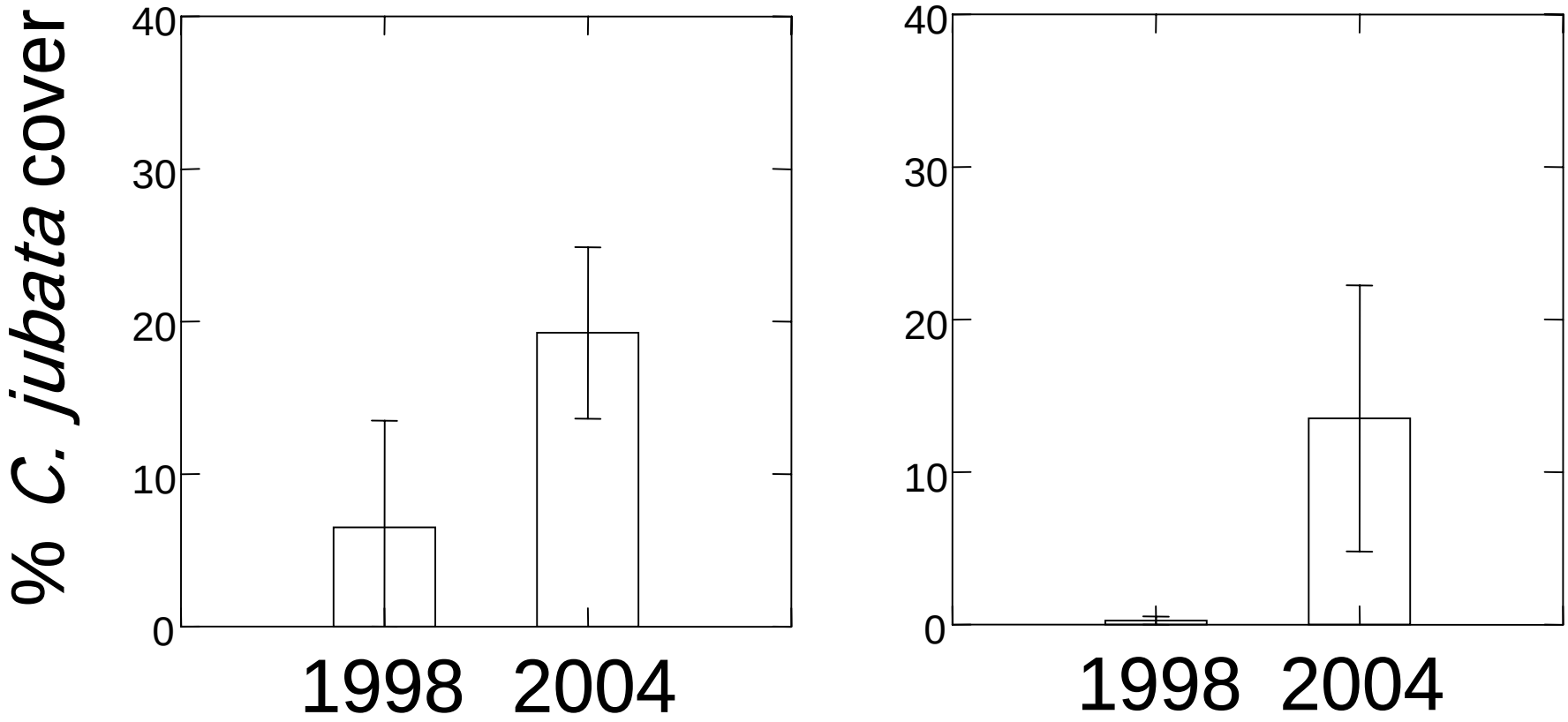
Propagule pressure



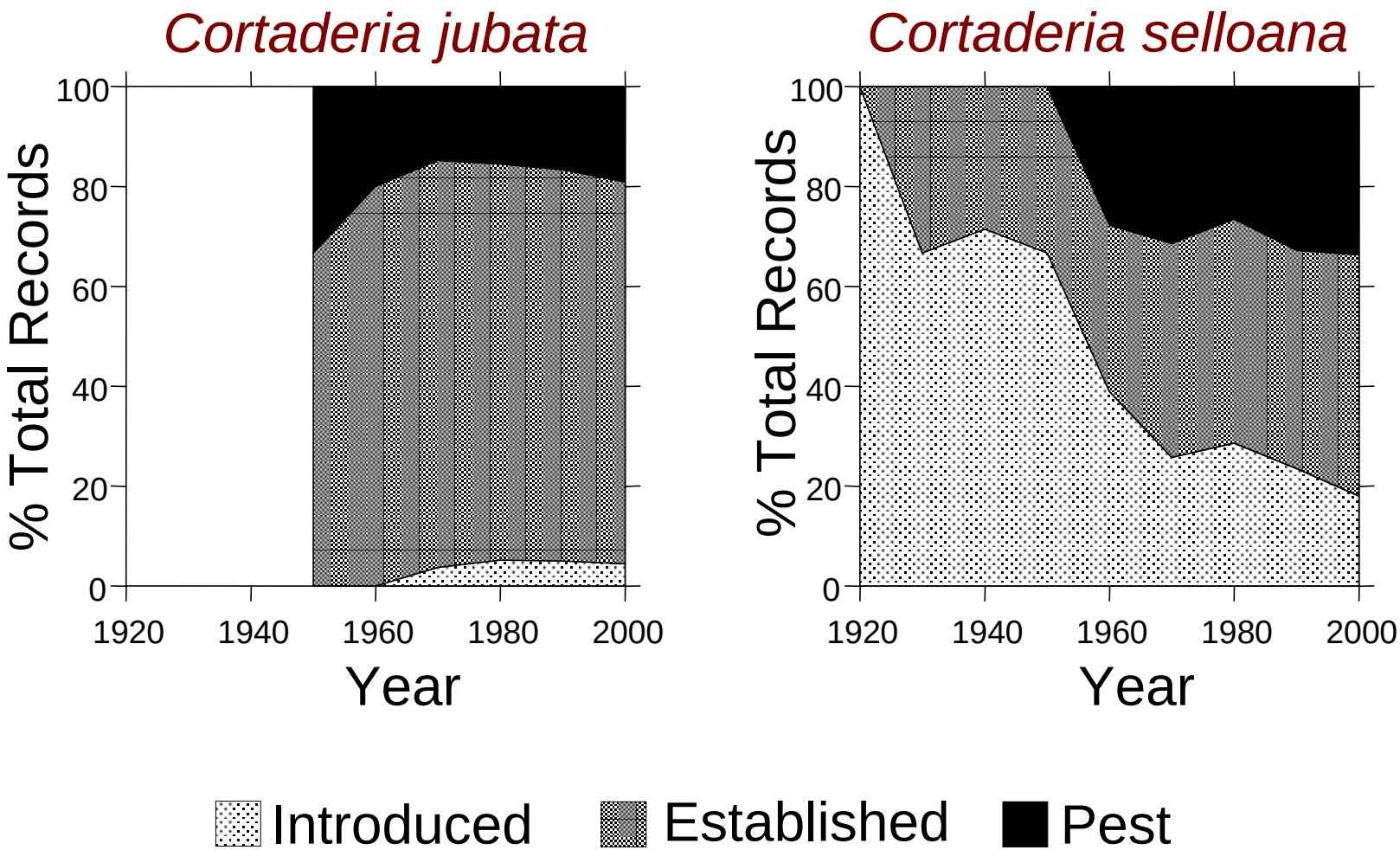
Interacts with habitat modification



There is a slow loss of shrublands on VAFB



Invasiveness of *C. selloana* has increased over time



Management practices need to be as dynamic as the processes influencing the spread of ornamentals across the W-U interface

How to manage this dynamism?

- More emphasis on processes rather than static traits
- Better intelligence (e.g. monitoring, surveys), including better information on impact
- A framework to compile, collate, and synthesize information....Cal-IPC!

Griffith Park, 1940’s