

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

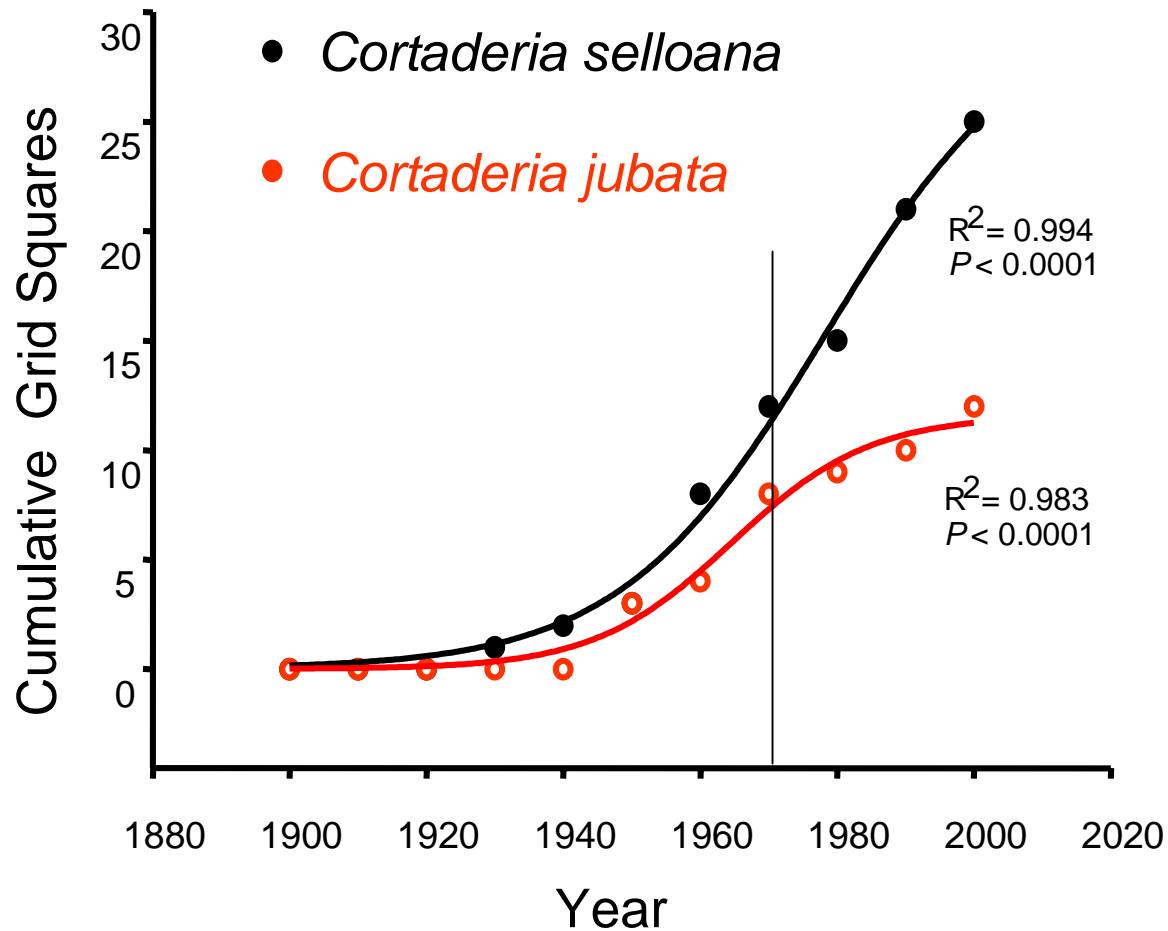


C. jubata
apomictic asexual



C. selloana
sexual, dioecious

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



Plant Now—Watch It Tower This Year!

White Feather Pampas Grass

“The King Of Ornamental Grasses”



**WE SHIP HARDY
LIVE PLANTS READY
FOR PLANTING!**

Shoots Up To 10 Feet Tall!

You've seen waves of majestic Pampas Grass growing wild in the countryside. Now watch it tower from 8 to 10 feet tall...right in your own backyard! Huge lofty plumes draw the eye wherever you plant them. They're stunning in your garden and highly prized for indoor dried arrangements. Each plant yields multiple shoots. Plus, they're practically trouble-free, with no need to spray for insects. Our hardy plants grow in most any soil. Order now at this great low price—and save!

We will ship your order to your area at the proper planting times.

- **Easy To Grow**
- **Blooms With Big, Majestic Puffy White Plumes**
- **Adds Grace, Texture & Height**
- **Dries Beautifully & Easily For Dried Flower Arrangements**
- **Elegant Landscape Accent**
- **Attractive Privacy Screen**

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 Roezli



Colorado Springs, 1896

P127



Rose Parade, 1896

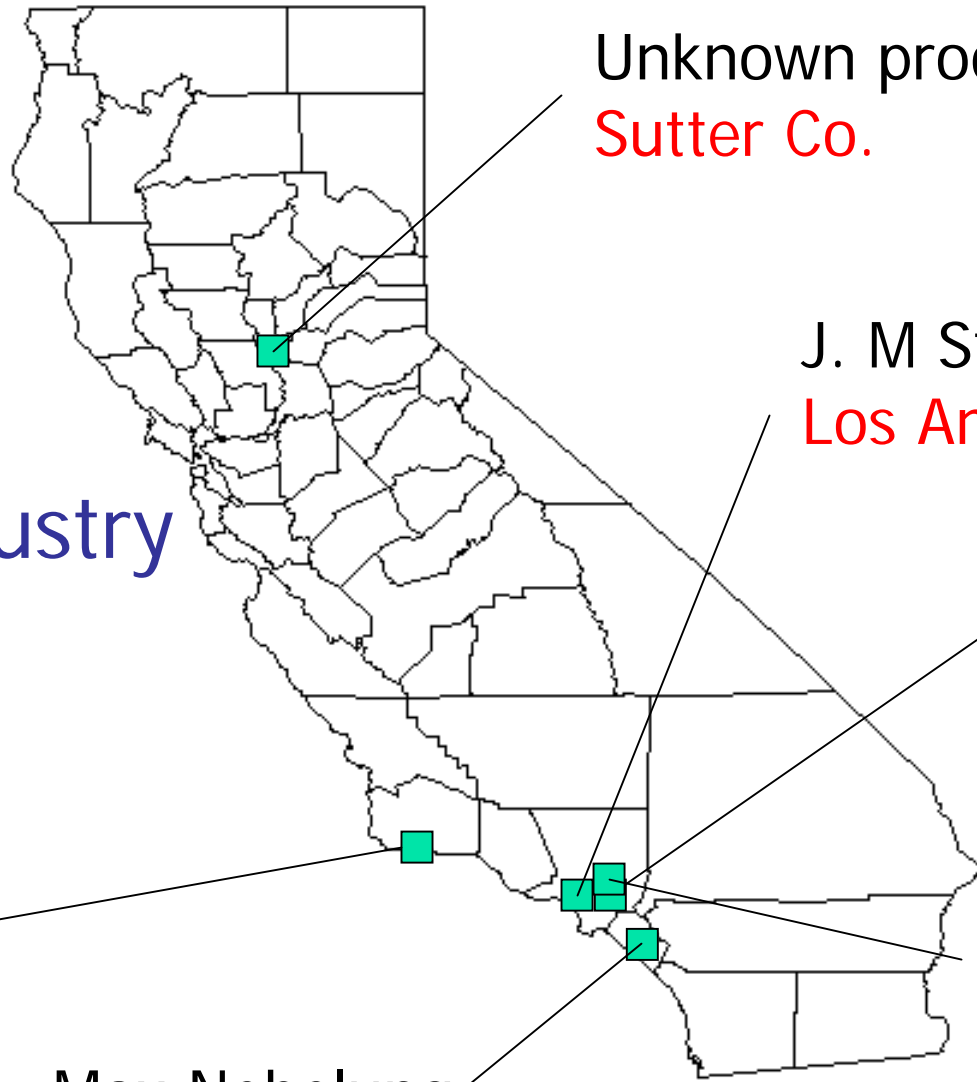


Joseph Sexton
pampas grass pioneer



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

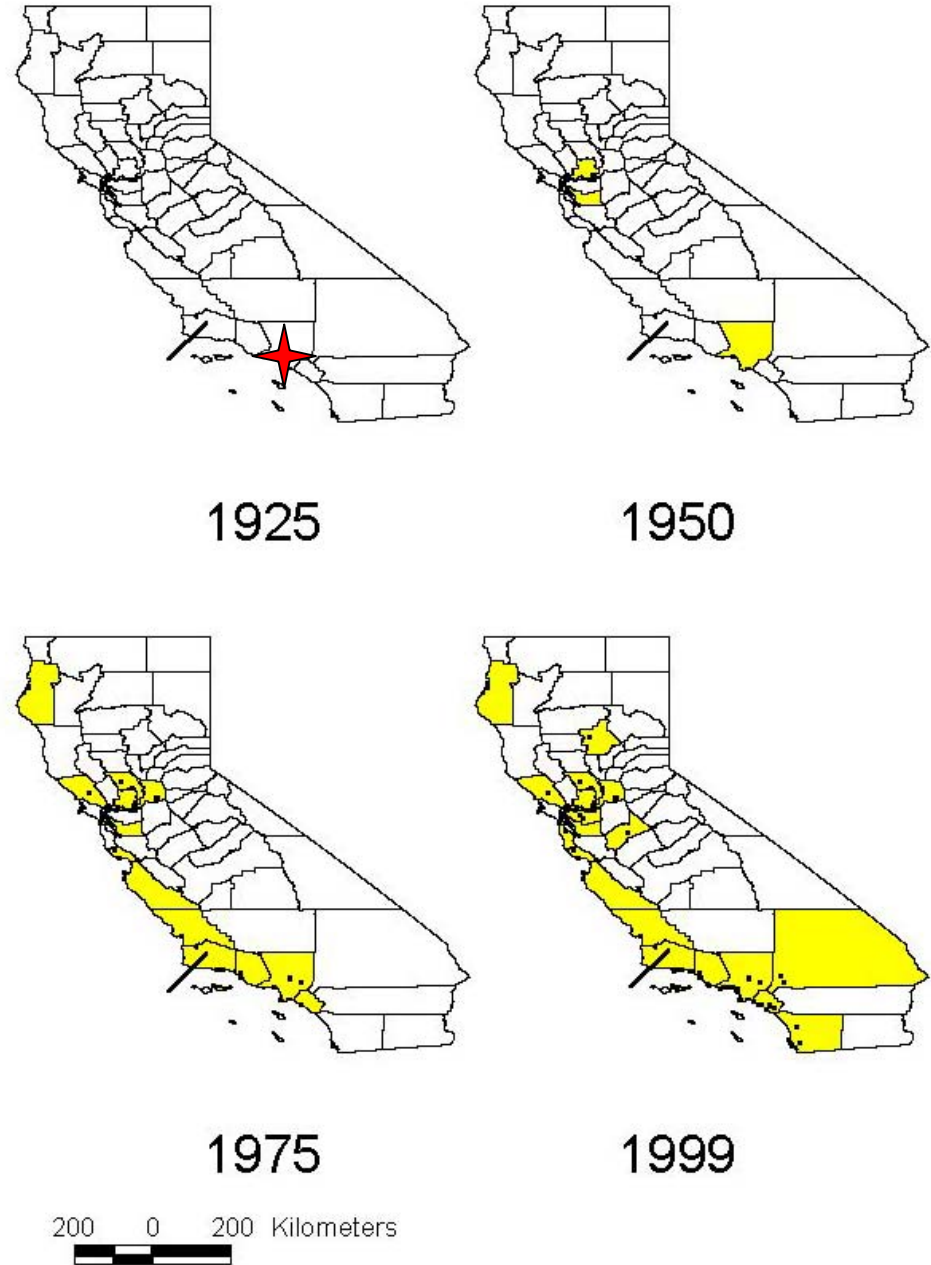
Harriet Strong
Whittier

Joseph Sexton
Goleta

Max Nebelung
Anaheim

Cortaderia selloana

- Expanded from the two urban foci of Los Angeles 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.



1925



1950



1975



1999

200 0 200 Kilometers

A scale bar with three segments: a black segment on the left, a white segment in the middle, and a black segment on the right. The numbers 200, 0, and 200 are placed above the segments, and the word "Kilometers" is placed to the right of the bar.



Los Angeles, 1887



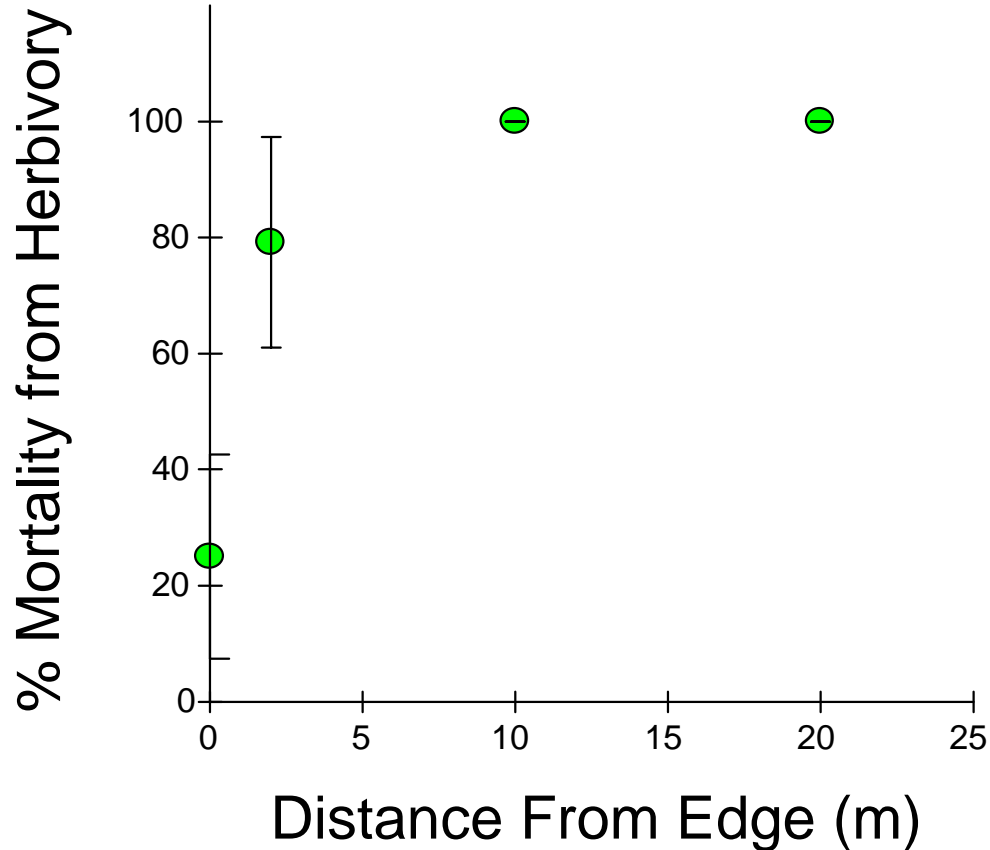
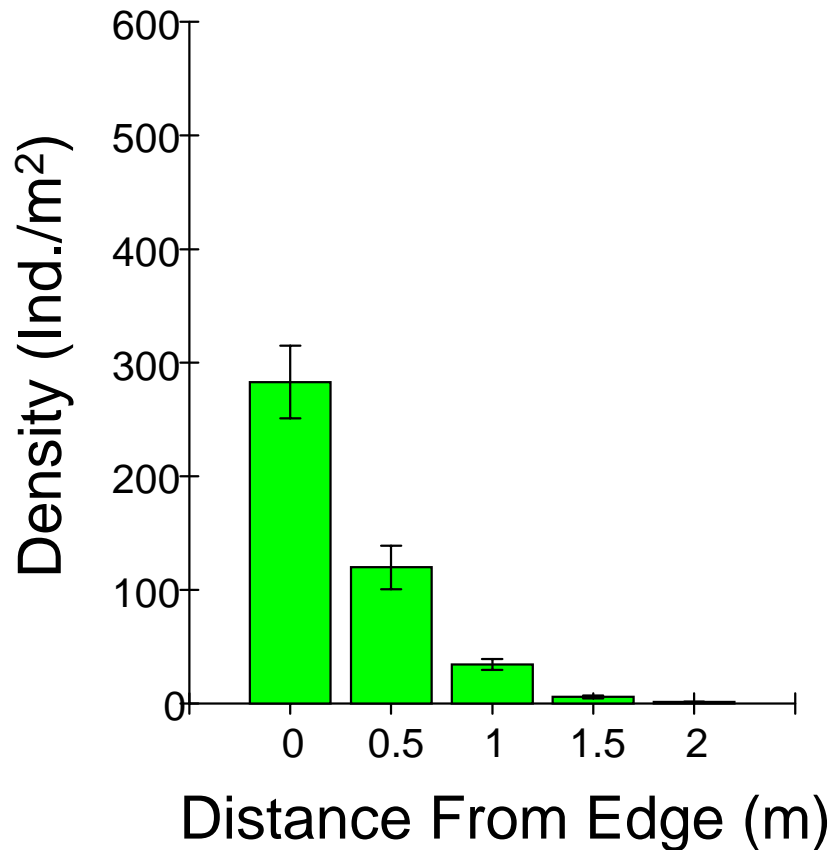
Los Angeles, 1889



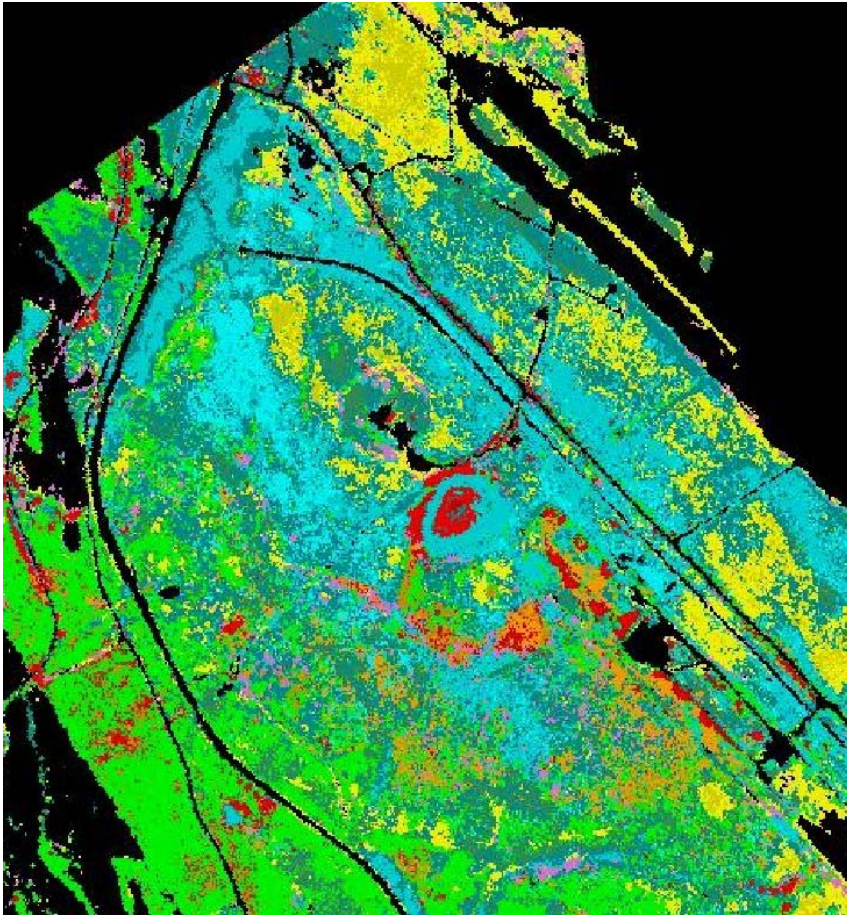
V77. A HEDGE OF PAMPAS GRASS GROWING ALONG A SANTA CLARA VALLEY ROADWAY. MRS. HARRIS PHOTO.

Santa Clara, 1880's

Wild lands resist *Cortaderia* invasion



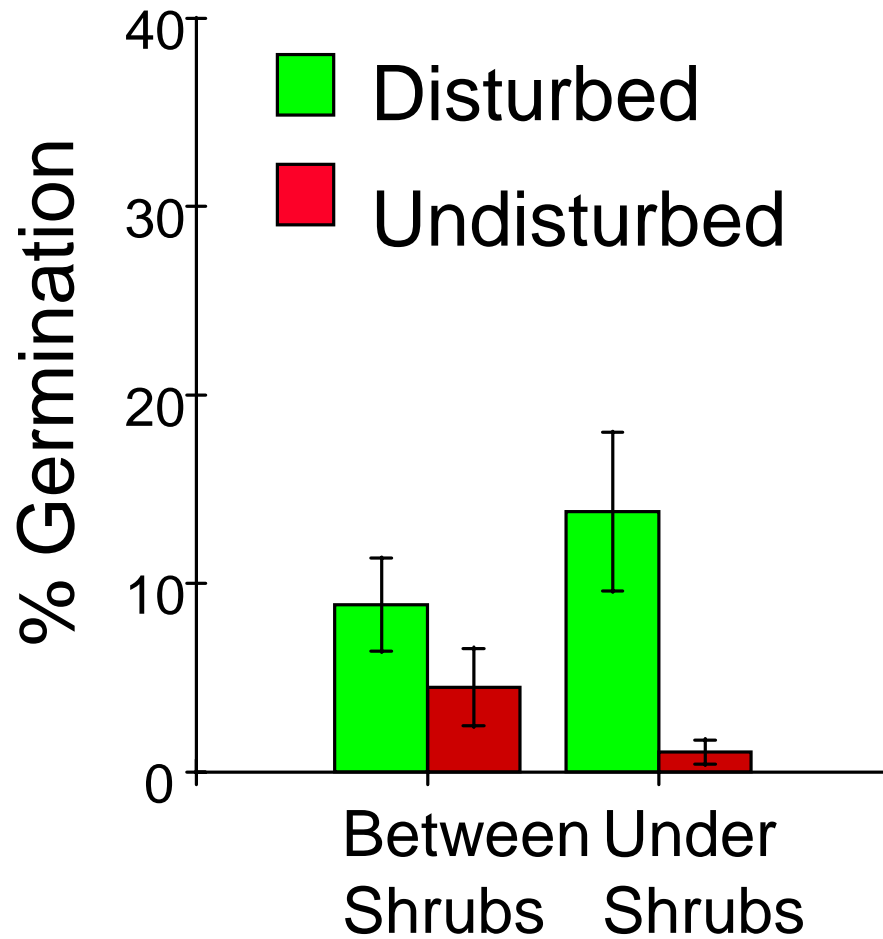
Vandenberg AFB



But humans can
compromise this
resistance

Courtesy CSTARS, UC Davis

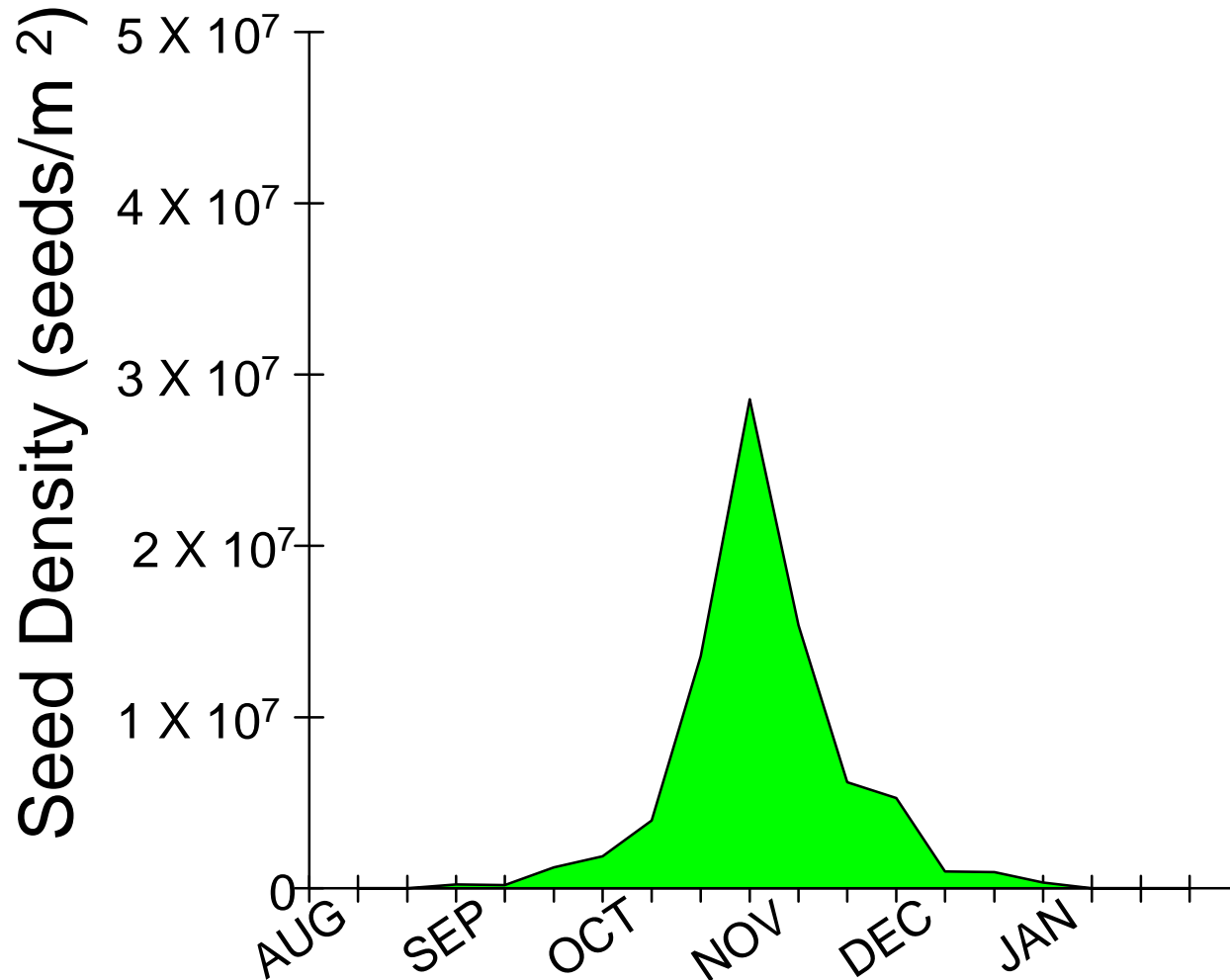
Disturbance



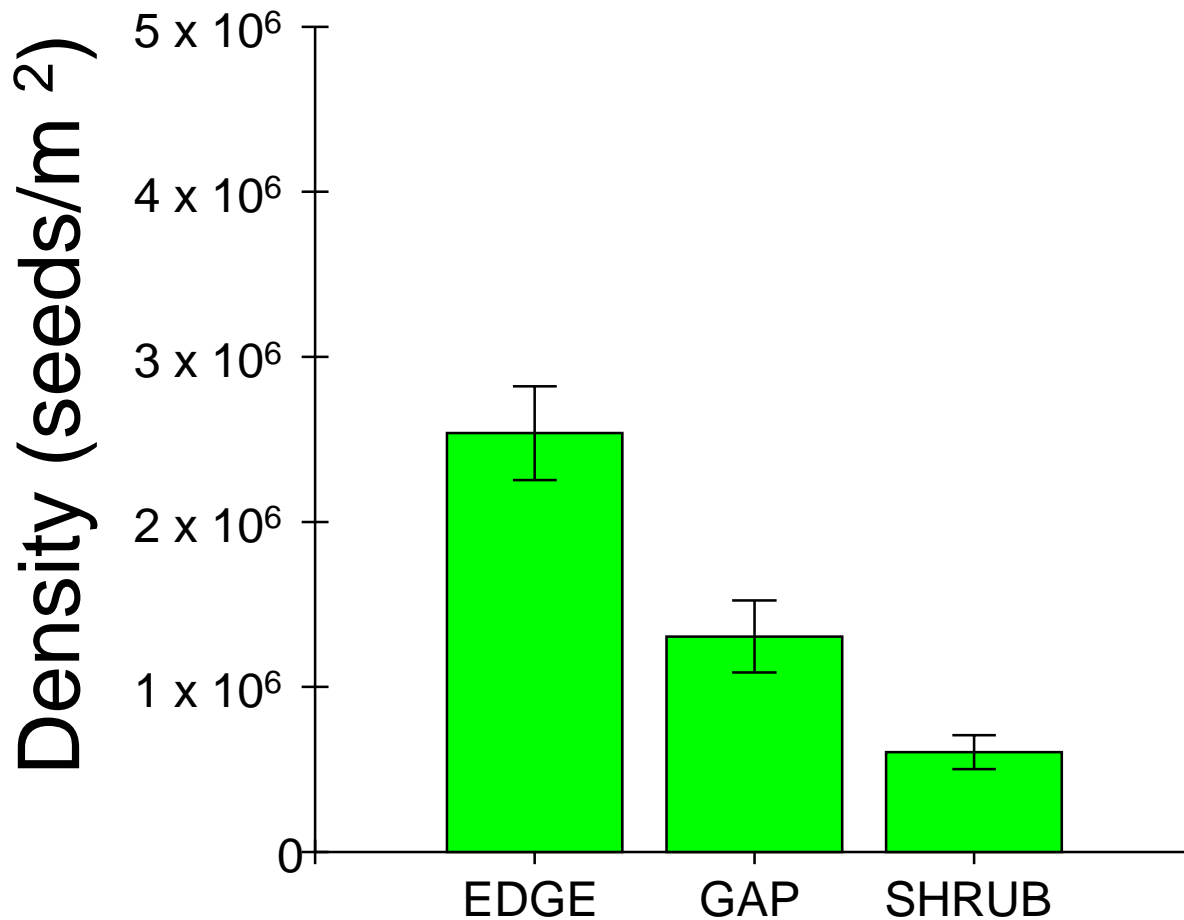
Other processes common on the W-U interface

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

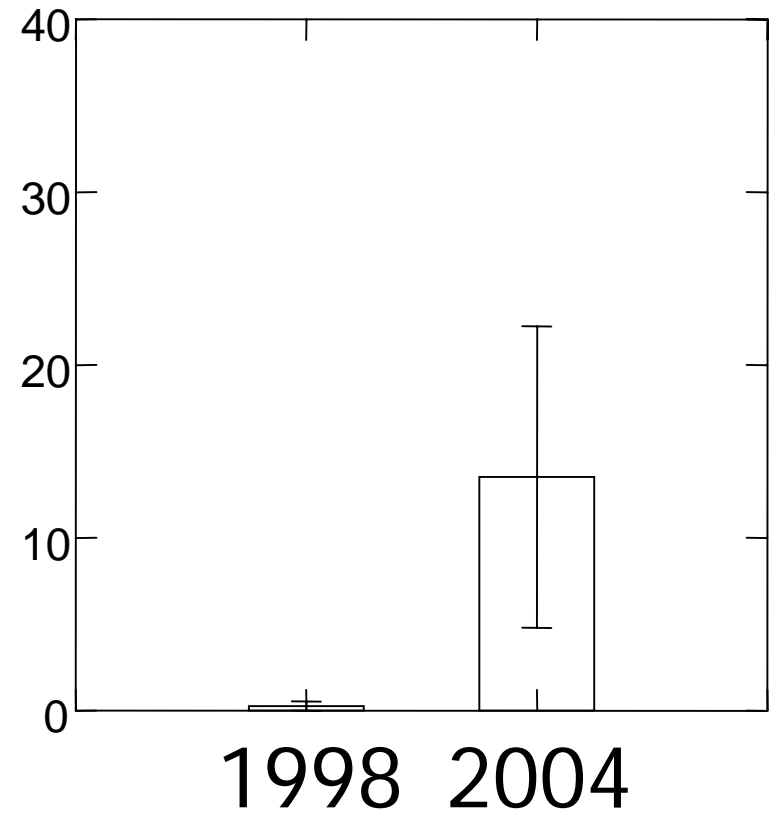
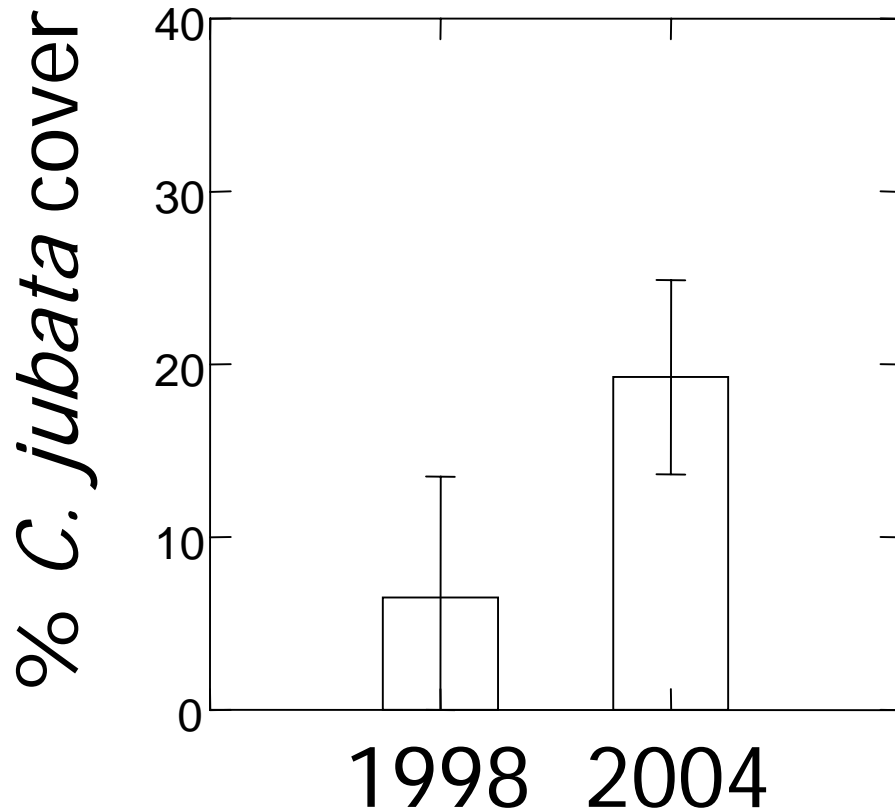
Propagule pressure



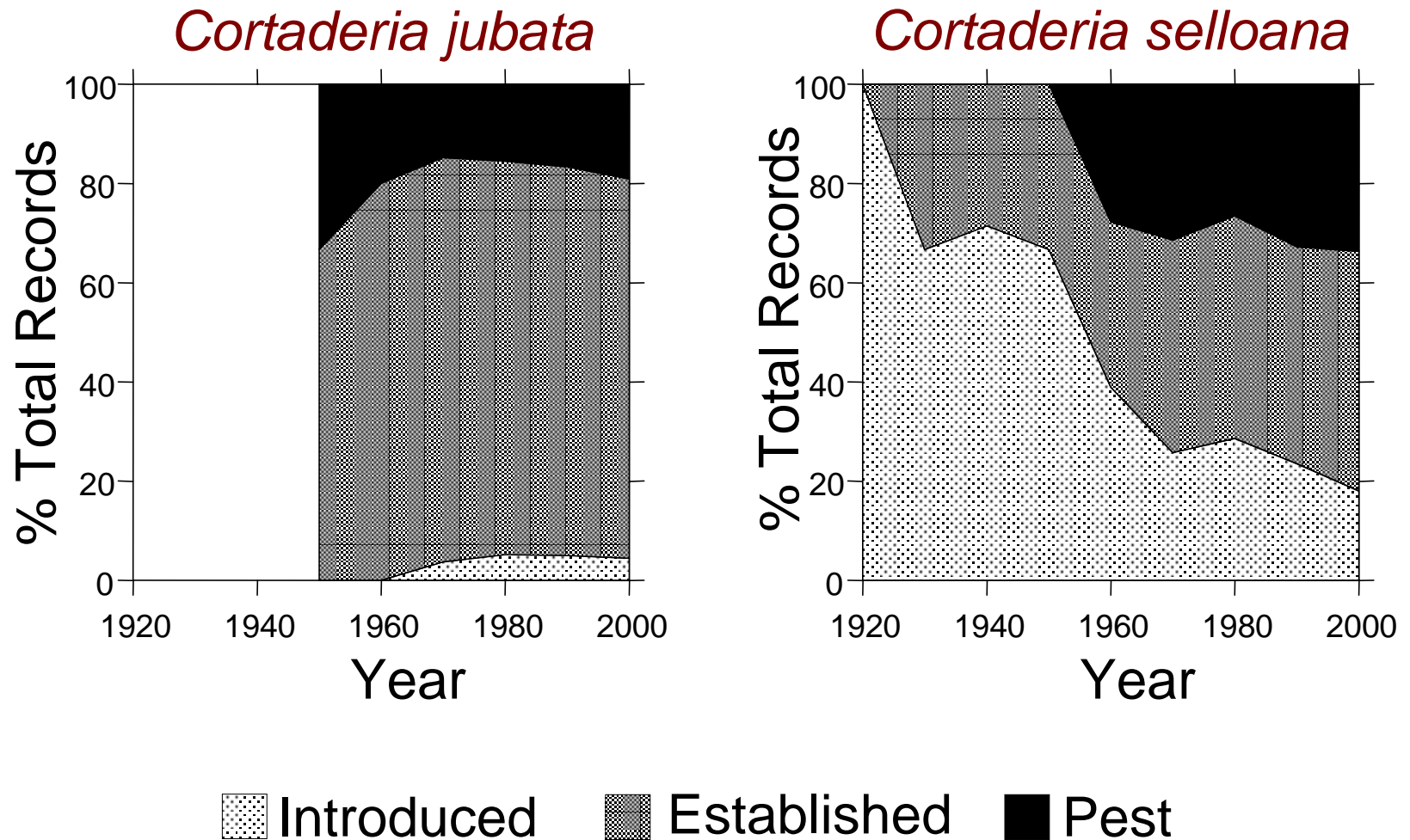
Interacts with habitat modification



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