



The Nature Conservancy

Mission: To preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.



Locations of *Opuntia corallicola* - 2002



Outline:

- History of *Cactoblastis* in Florida
- Potential impacts on biodiversity
- Ecology of *Cactoblastis* and *O. corallicola*
 - Biology of *O. corallicola*
 - Impact of *Cactoblastis*
 - TNC response
 - Reintroduction experiments



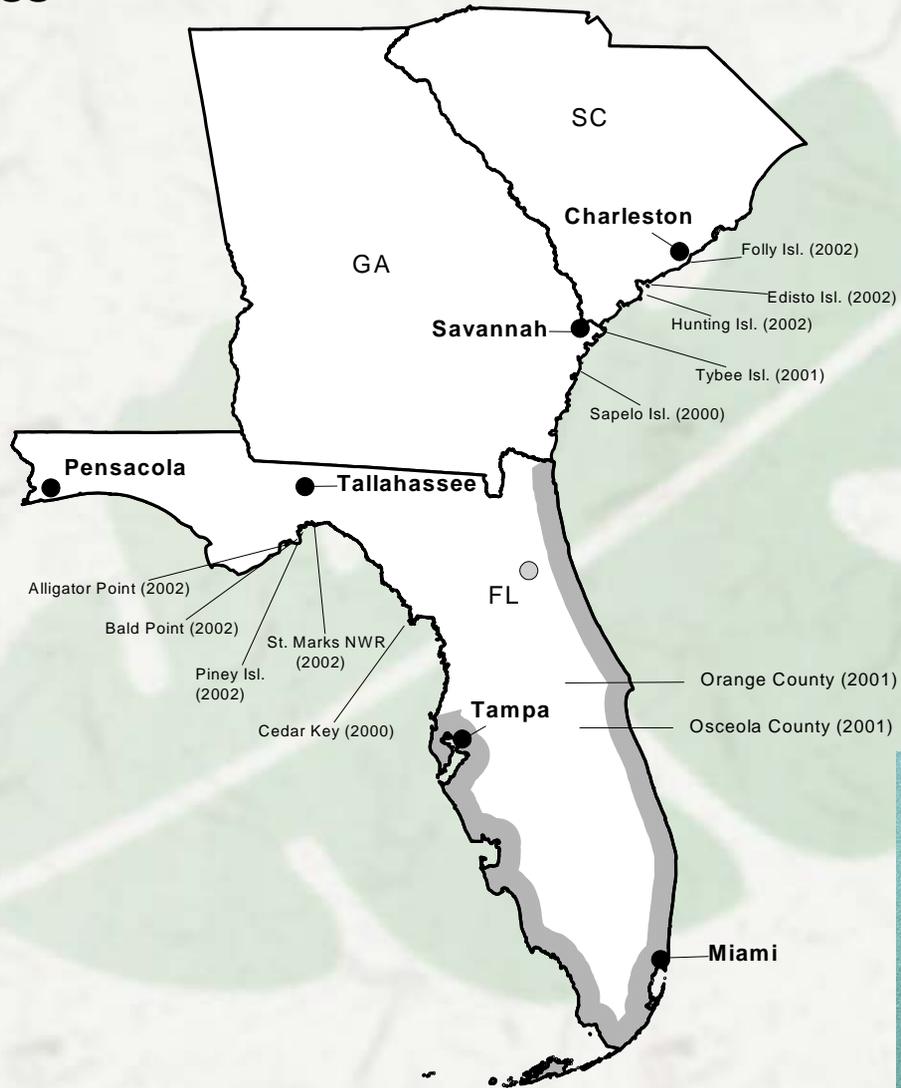


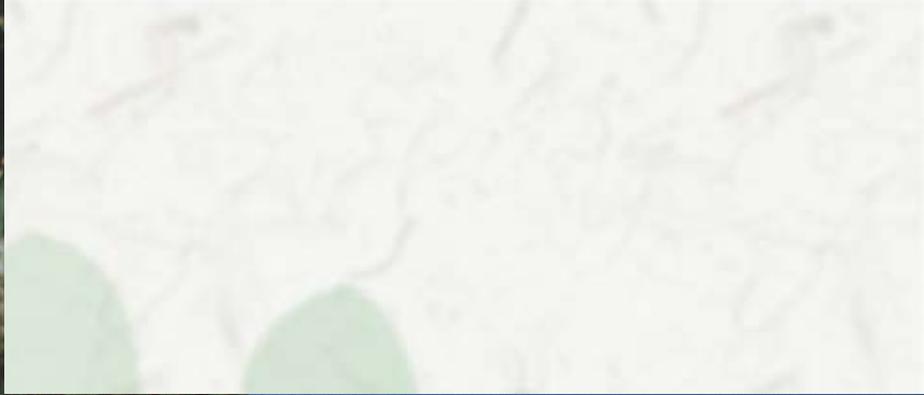
Timeline of *Cactoblastis* in Florida

- 1988** FL botanists alerted that *Cactoblastis* was found in Cuba
- 1989** *Cactoblastis* found on *O. stricta* on Big Pine Key
- 1990** *Cactoblastis* kills 1 of 14 remaining *O. corallicola*
- 1990** *Cactoblastis* found 200 km N of Big Pine Key
- 1993-2002** *Cactoblastis* moving northward at 50+ km/yr
- 2000** *Cactoblastis* found in nursery stock in NW Florida

Map by Ken Bloem

Hight et al. in press







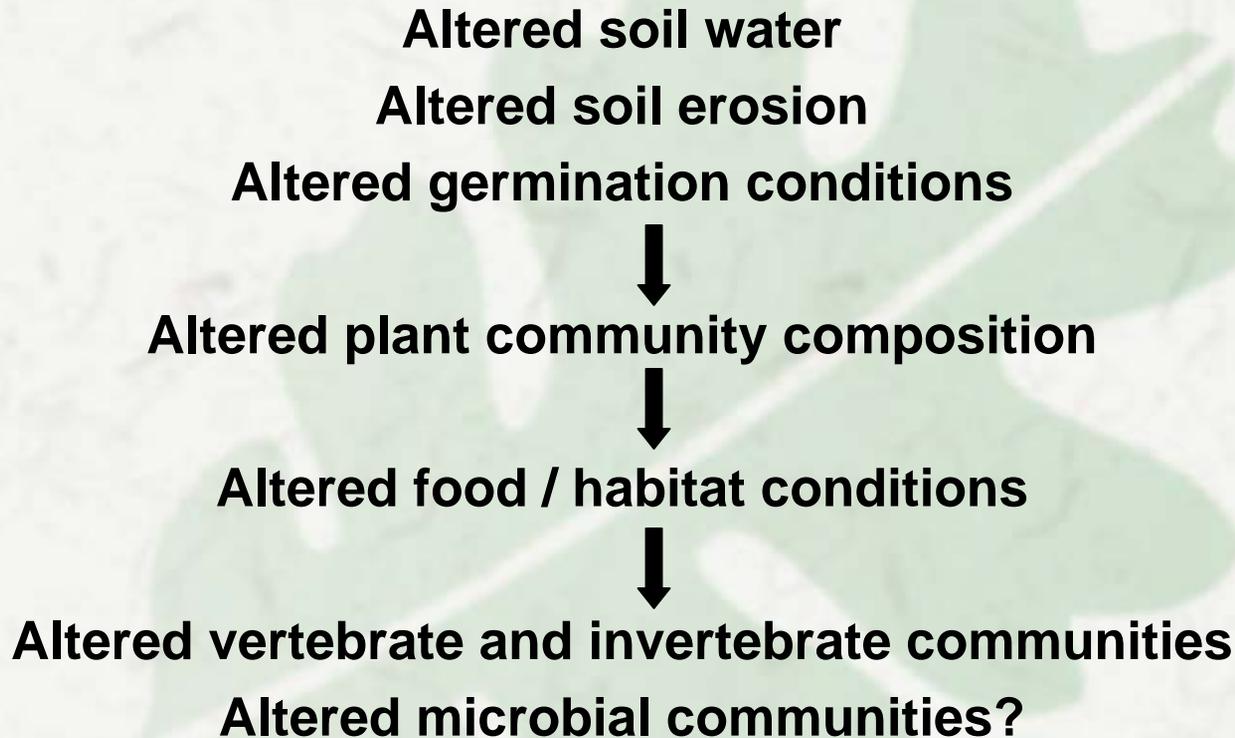
Potential impacts to diversity*

- **Platyopuntia**
 - **U.S. has 31 species, 9 endemic**
 - **Mexico has 56 species, 38 endemic**
 - **Caribbean has 22 species**
 - **Bahamas has 3**
 - **Central America has 17 species**
 - **Guatemala has 6**
 - **Costa Rica and most other countries have 2- 4**
- **May also attack *Consolea***
 - **9 endemic to Caribbean**
- **Also attacks one species of *Cereus* in Argentina...**

*approximate numbers



Potential impacts of Opuntia loss



A photograph of a cactus with several bright yellow flowers. The cactus has green, segmented stems with many sharp, thin spines. The background is a blurred natural setting with green foliage and brown ground.

Opuntia triacanthos

Photo by T. Ann Williams

- 90% attack rates on *O. stricta* in FL with 15% mortality.
- Small cacti most vulnerable

Johnson and Stiling

Ecology of *Cactoblastis* and *O. corallicola* in Florida

- **Biology of *Opuntia corallicola***
- **Impact of *Cactoblastis***
- **TNC response**
- **Reintroduction experiments**



Biology of *O. corallicola*

- **Size**

- Height of mature individuals up to 2.3 m and relatively stable until Hurricane Georges (1998)
- Pad number highly variable (0-230) but stable over 5 years until Hurricane Georges
- Fallen pads sprout but rarely grow over 0.5 m before dying

- **Genetics**

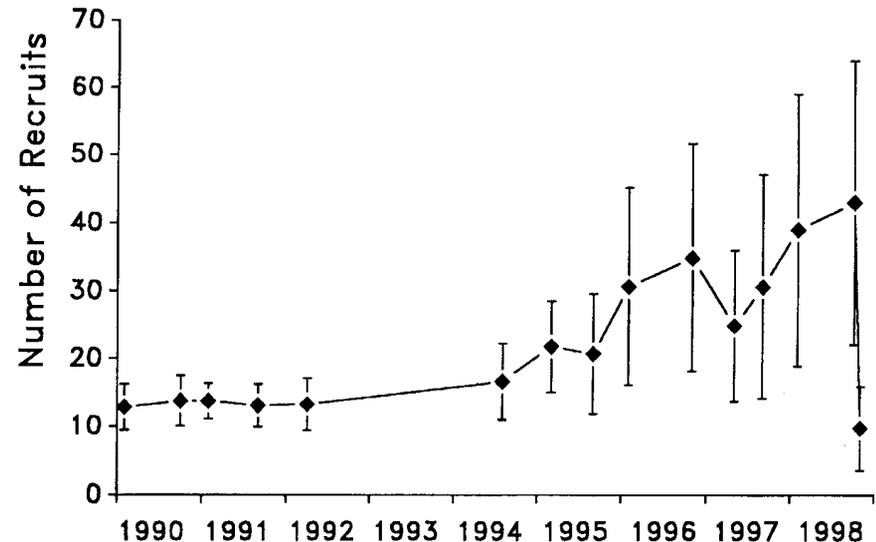
- 7 unique individuals

- **Reproduction**

- Agamospermous
- Population functionally male

- **Numbers**

- 14 in 1990, 8 in 2002



Impact of *Cactoblastis* on *O. corallicola*

- **One (of 14) mature individual killed in 1990**
- **One mature cactus in 1994, 2 in 1999, and one in 2000 with pads attacked**
- **Two seedlings in 2001 with pads attacked**
- ***Cactoblastis* active year round, with peaks in May-June and Aug.-Sept., and minor peak in Oct.-Dec.**
- **No evidence of *Cactoblastis* in Swan Key population**



TNC response to *Cactoblastis* threat

**1990 Erected screen cages
around most cacti**





**1999
Removed cages
because of storm
damage**



Instructions to volunteers:

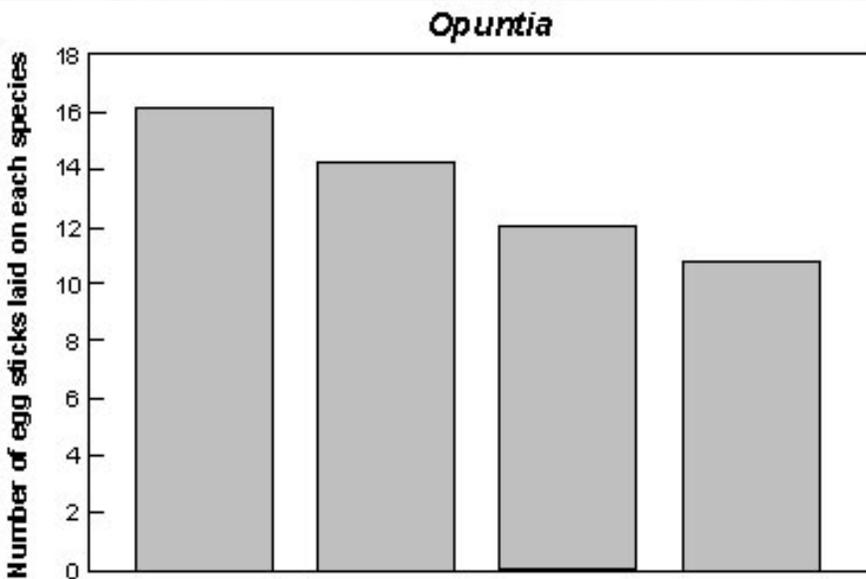
Carefully examine all cacti weekly.

If an eggstick is found on a pad and there are no signs of hatched larvae - remove, crush the eggs and drown them in a mosquito ditch.



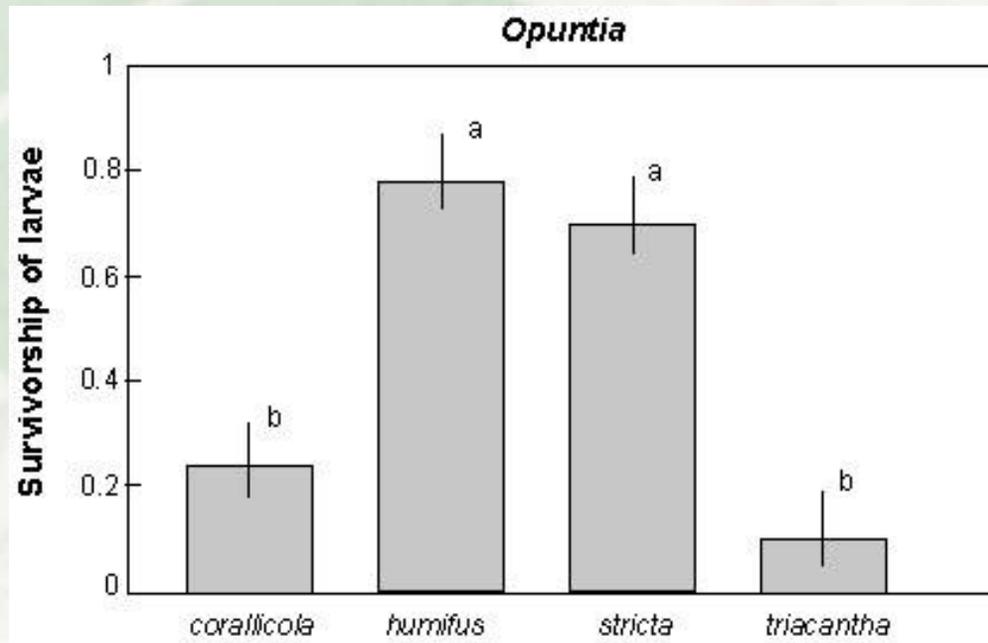
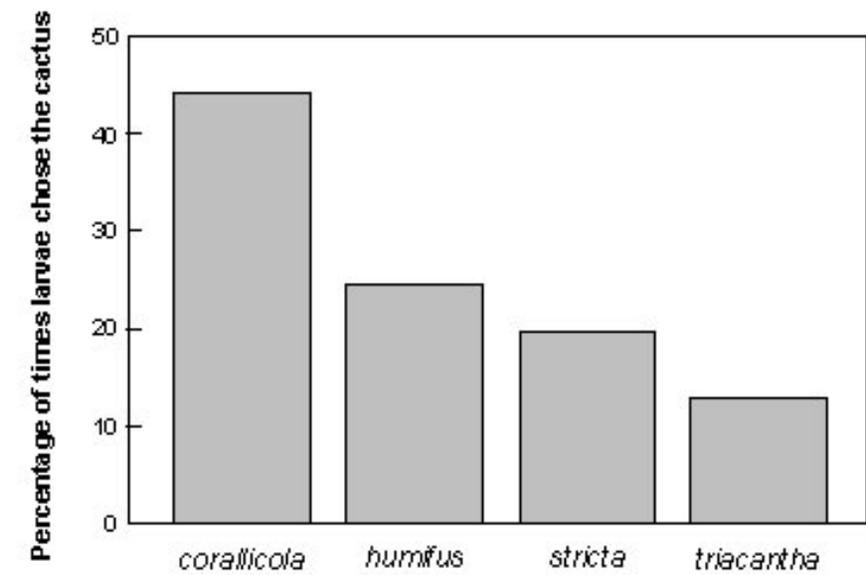
If we have missed the eggstick stage and a larvae-infested pad is found, TNC staff verify the identification and destroy the pad and larvae.

Research:



***Cactoblastis* larvae and adults prefer *O. corallicola* over other opuntia even though survival is lower.**

Johnson and Stiling



Several outplanting experiments by Peter Stiling, TNC, and Fairchild Tropical Garden.



Caged vs. not



Sun vs. shade





Near *O. stricta* with
Cactoblastis

vs.



Near *O. stricta* without
Cactoblastis

or



Far from any opuntia

