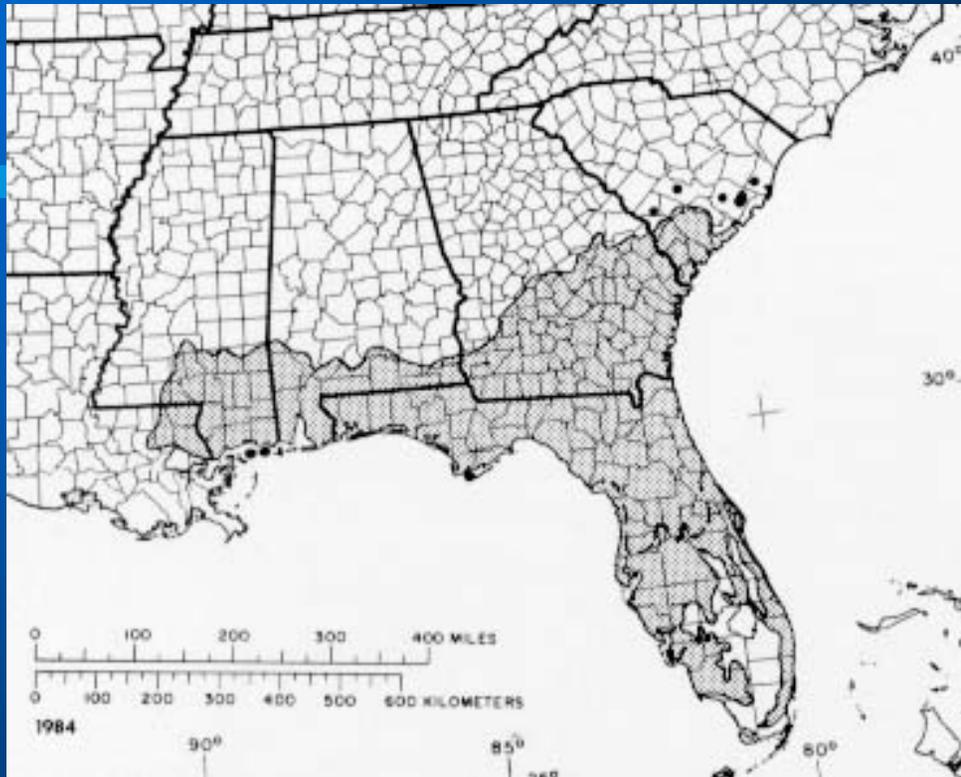




South Florida Ecological Services Office, Vero Beach

Fire and biogeography in pine rocklands of the Keys: an overview

Phillip Hughes
Big Pine Key Sub-office

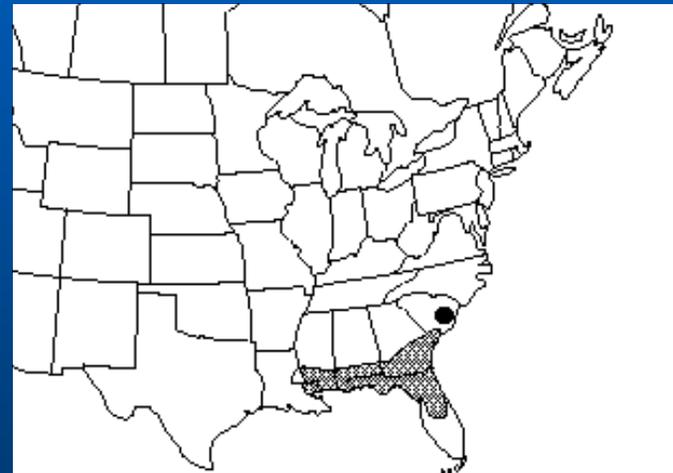


The native range of slash pine (*Pinus elliottii*)



Pinus elliottii var.
densa

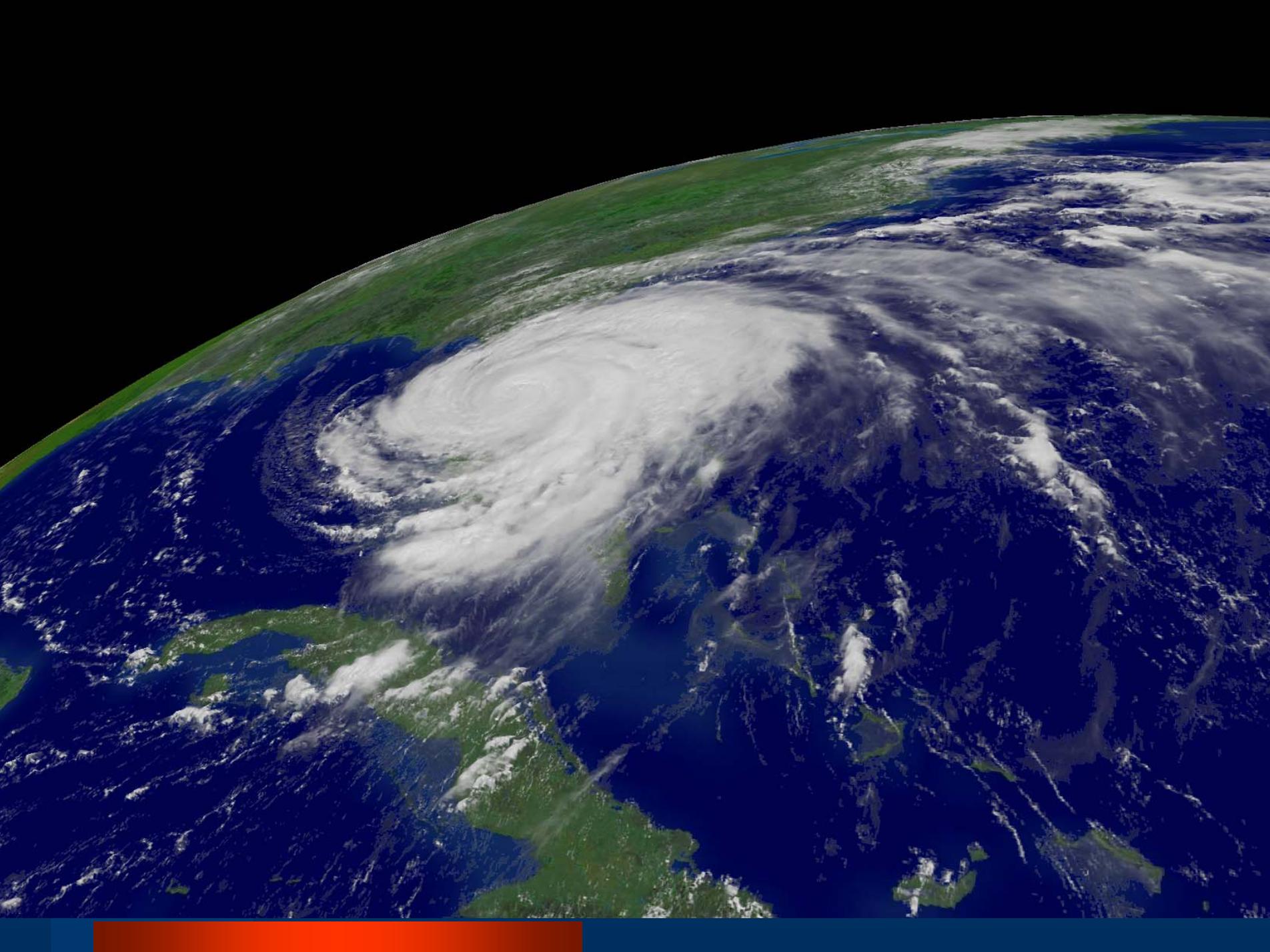
Pinus elliottii var.
elliottii



The ranges of Slash pine varieties



The native range of Longleaf pine (*Pinus palustris*)



Moving forward

- We have great need to advance our information base (landform models, hydrology, vegetation, climate, fire effects), and many here today are striving to do so.
- Without these, knowledge about many plant and wildlife interactions will remain speculative on at least some levels.

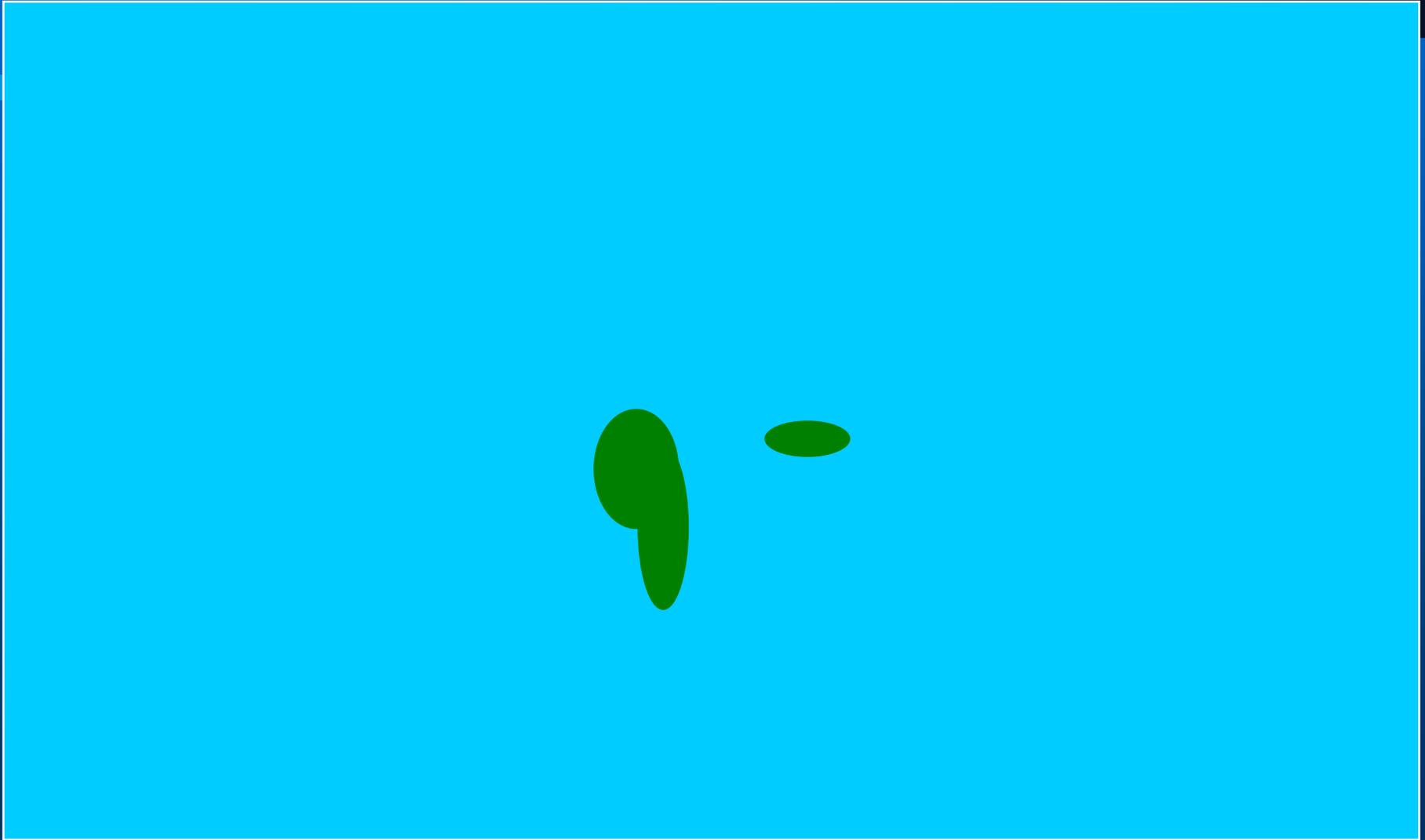
Ecosystem disturbances

<u>Hurricanes</u> <u>Fire</u>		Species benefited or hindered	
		Sooner	Later
Y	Y	+/-	+/-
Y	N	+/-	+/-
N	N	+/-	+/-
N	Y	+/-	+/-

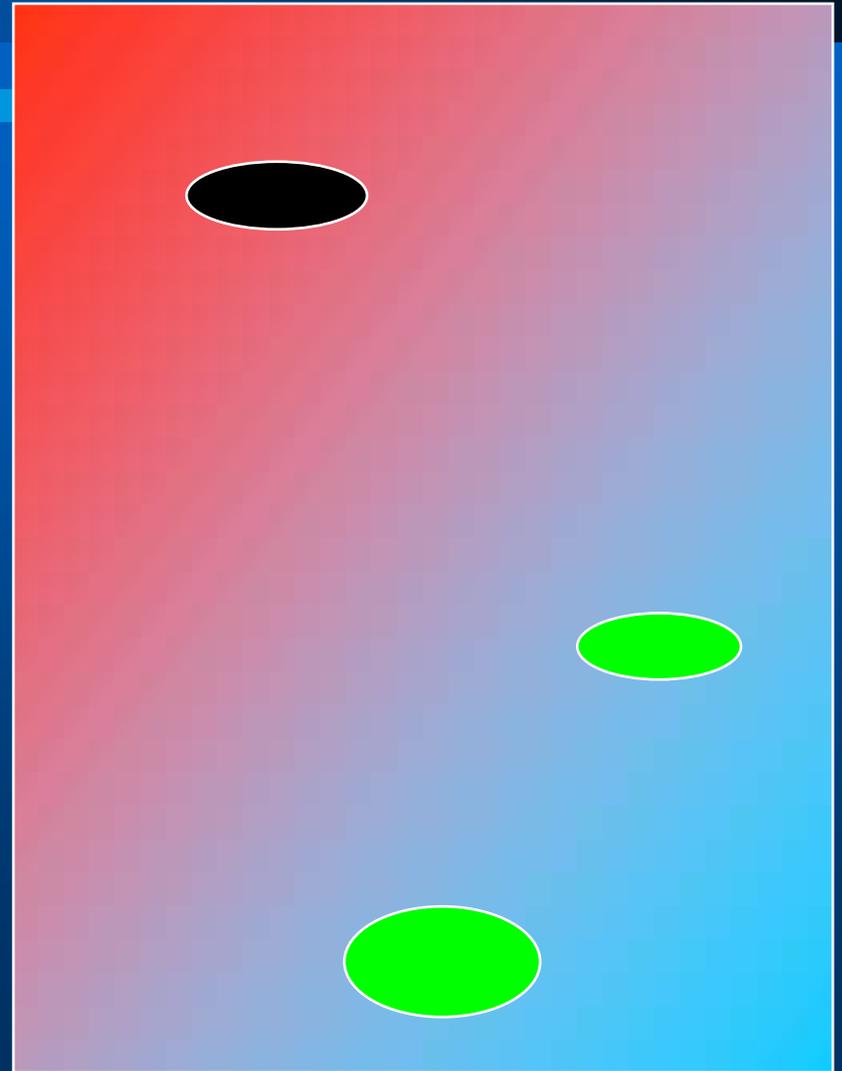
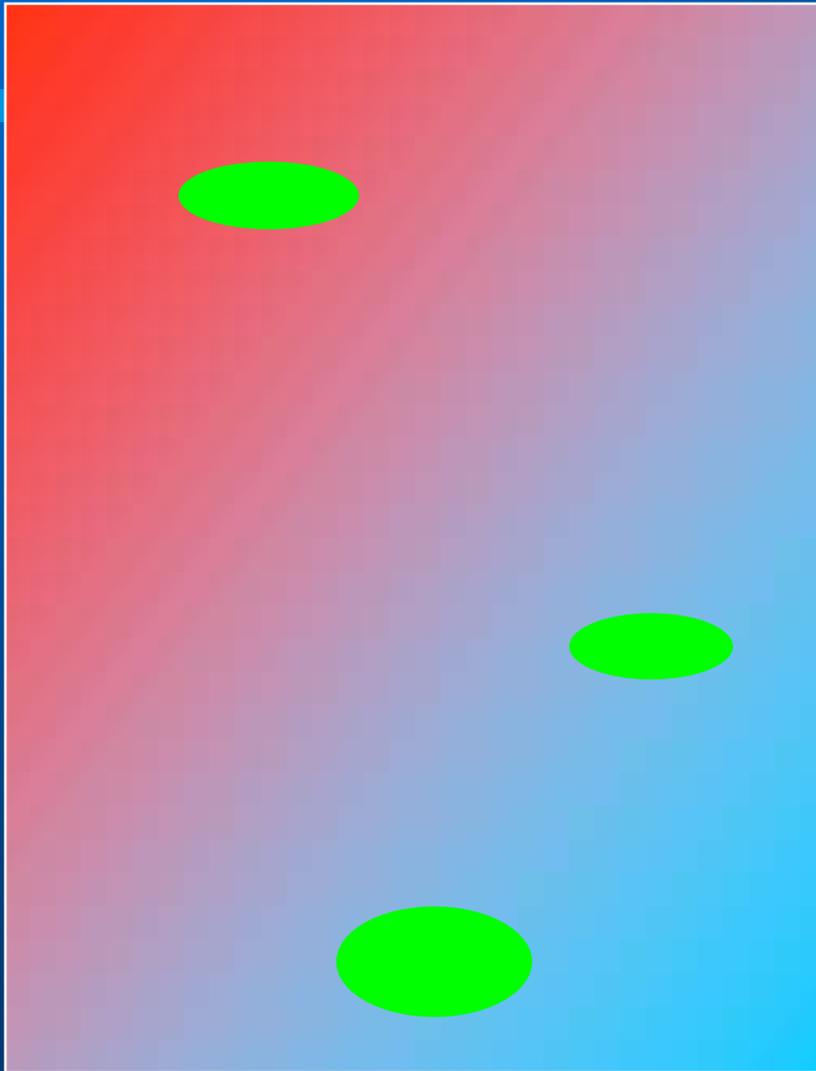
Landscape matrix



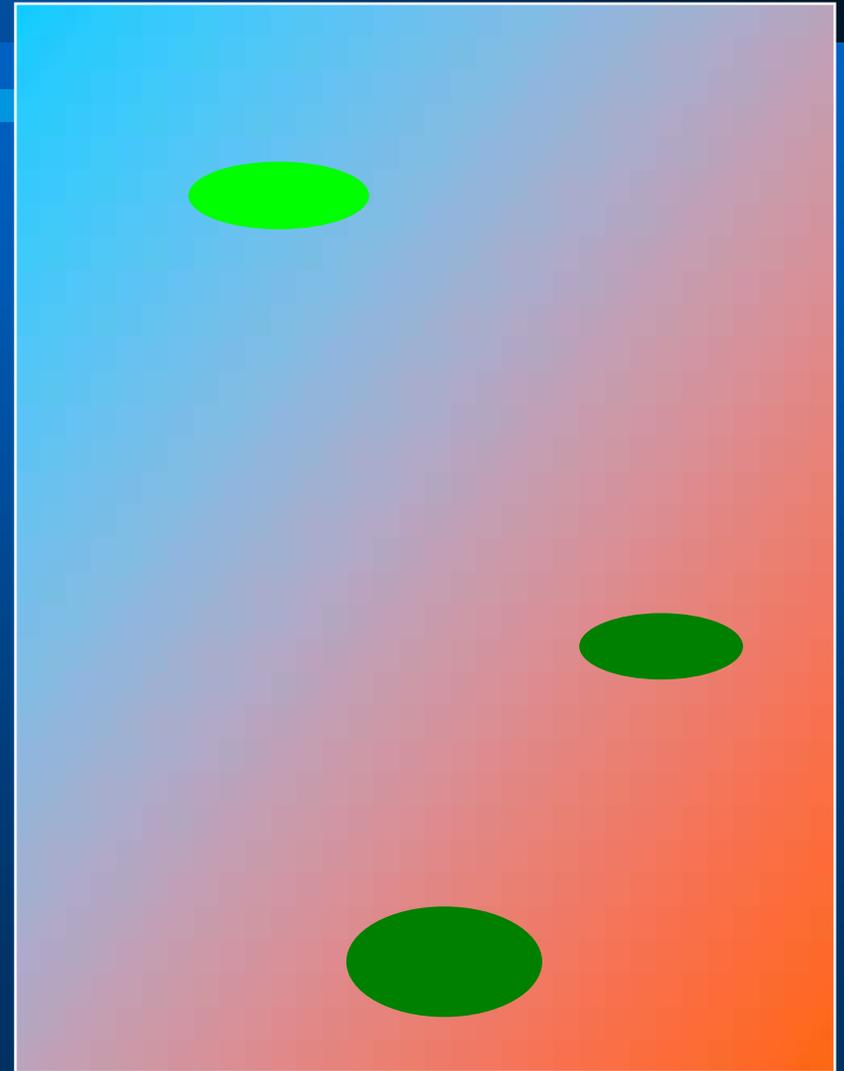
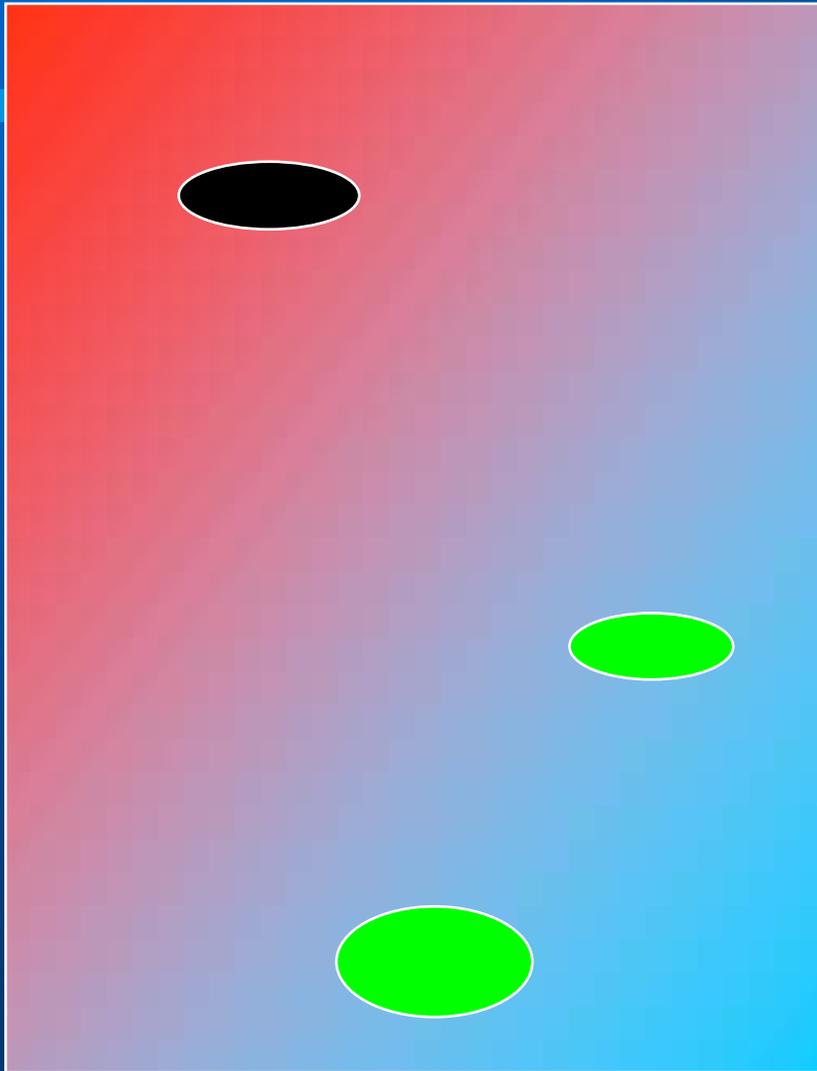
Landscape matrix



Patch dynamics within a stand



Patch dynamics within a stand



Butterflies

- Speaking of patchy...

Butterfly species of high concern in the Keys

- Gone:
 - Little Metalmark
 - Hayhurst's Scallopwing
 - Palmetto Skipper
- Possibly Gone:
 - Nickerbean Blue
 - Florida Leafwing
 - Zestos Skipper
 - Meske's Skipper (Rockland Grass Skipper)

Butterfly species of high concern in the Keys

- **Species of Concern (declining or having very small population sizes):**
 - Schaus's Swallowtail
 - Bahamian Swallowtail
 - Florida White
 - Miami Blue
 - Gray Ministreak
 - Silver-banded Hairstreak
 - Amethyst Hairstreak
 - Bartram's Hairstreak
 - Cuban Crescent
 - Tropical Buckeye
 - Florida Purplewing
 - Dingy Purplewing
 - Zarucco Duskywing
 - Twin-spot Skipper
 - "Klots' Palatka Skipper

Source: Mark Minno (March 2007)

Butterfly species of high concern in the Keys/ENP Pine rockland

- Gone:
 - Little Metalmark
 - Hayhurst's Scallopwing
 - Palmetto Skipper
- Possibly Gone:
 - Nickerbean Blue
 - Florida Leafwing
 - Zestos Skipper
 - Meske's Skipper (Rockland Grass Skipper)
- Declining or having very small population sizes:
 - Silver-banded Hairstreak
 - Bartram's Hairstreak

Florida Leafwing and Bartram's Hairstreak in the Pine rockland

“The leafwing remains stable in the Everglades, in fact we are finding it [in] more parts of Long Pine Key than normal. The hairstreak appears to have benefited greatly from the current prescribed burn regime in place in LPK, but there needs to be a bit of adaptive management put into their burn cycles. For example,” ...

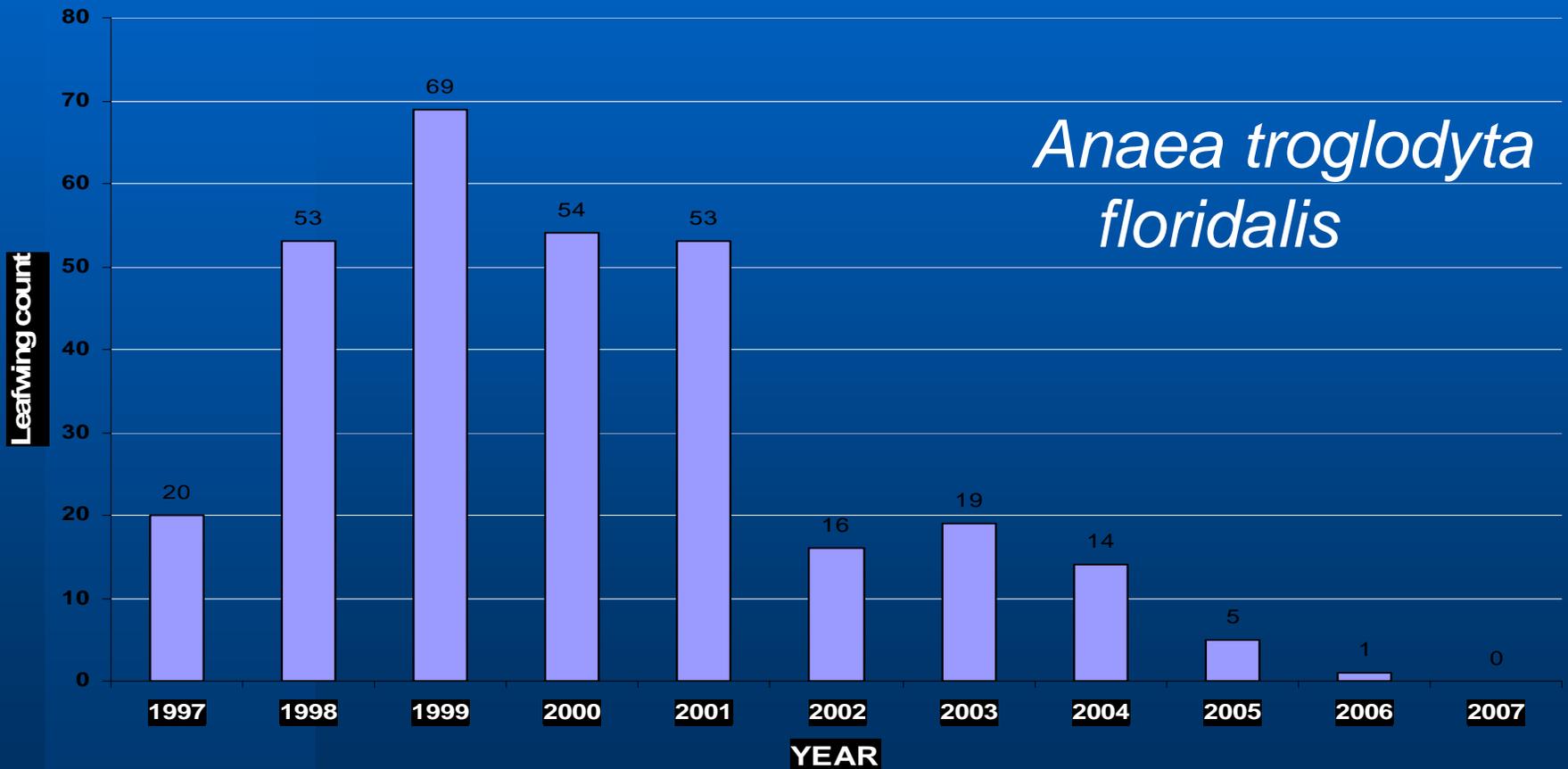
Florida Leafwing and Bartram's Hairstreak in the Pine rockland

“... I believe that the Florida Leafwing is either extremely rare or extirpated from the Keys. I've not seen it at the Navy Wells Preserve near Florida City either. I've only a seen a few individuals of the Florida Leafwing in Everglades National Park. In the 1980's this species was common on Big Pine Key, but the habitat there has changed dramatically in recent years.

Bartram's Hairstreak still occurs on Big Pine Key, at Navy Wells Preserve, and in Everglades National Park, but is not common.” ...



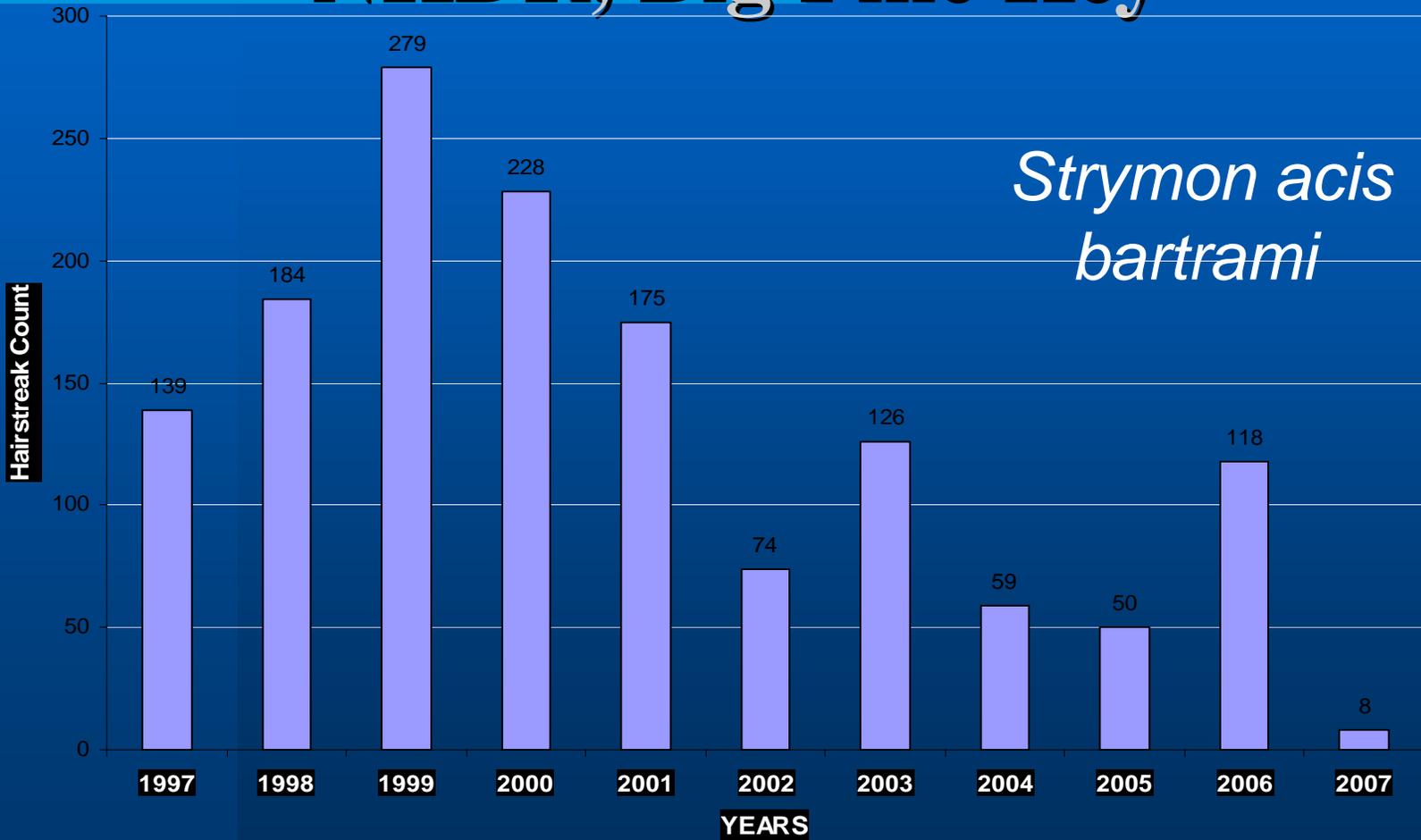
Annual Number of Florida leafwings on six transects within NKDR, Big Pine Key



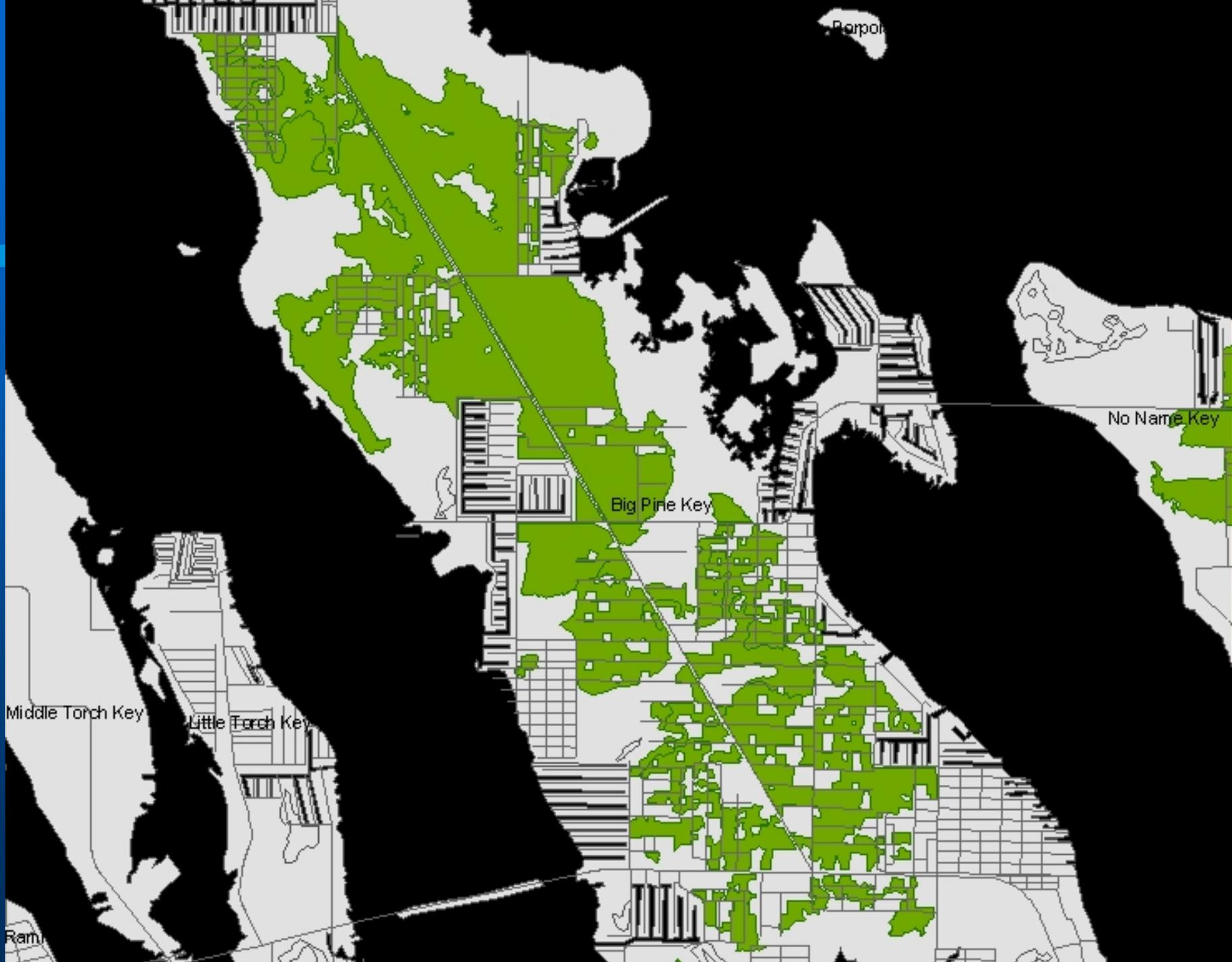
Source: (Salvato and Salvato, unpublished data; 2007) 19

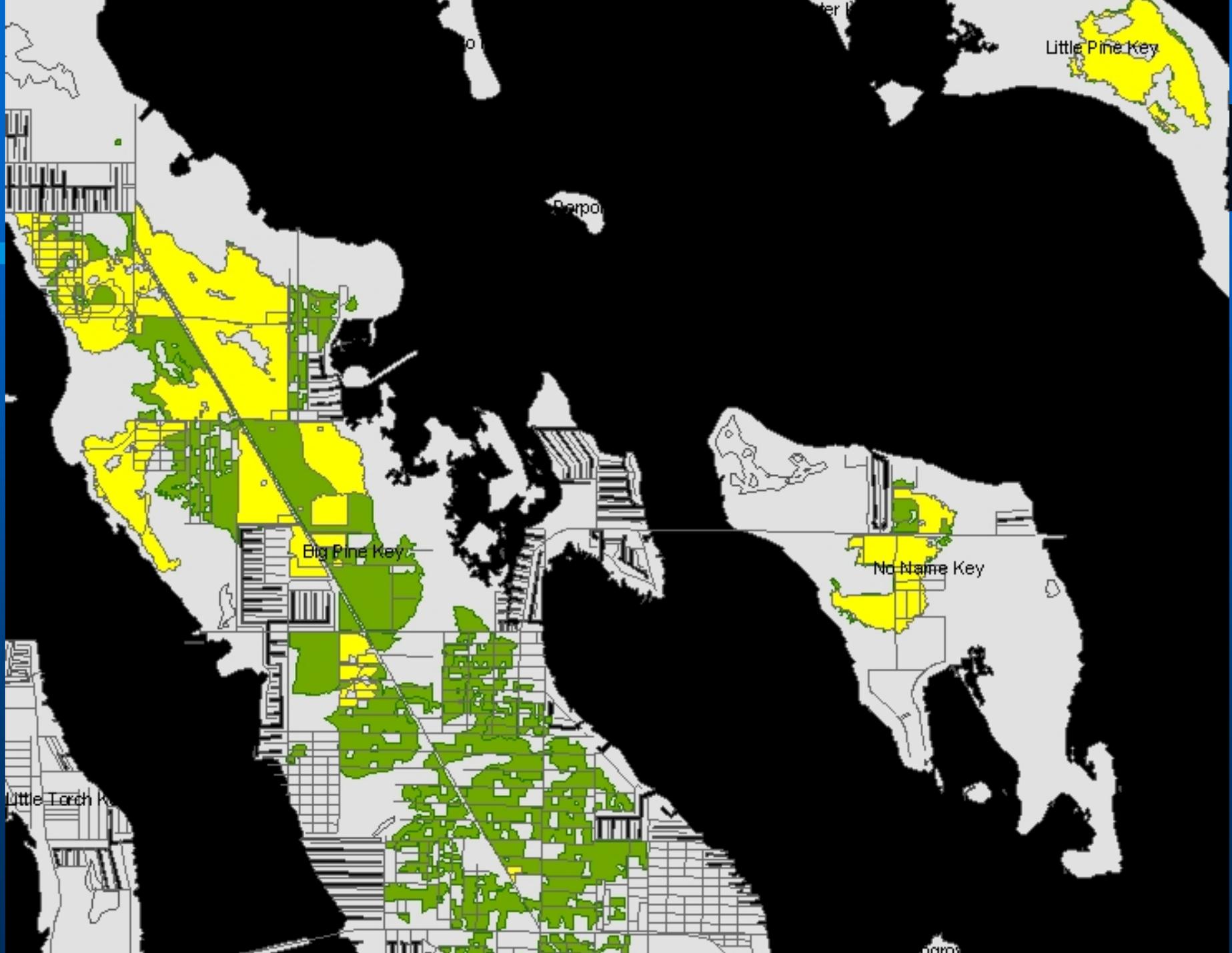


Annual Number of Bartram's hairstreaks on six transects within NKDR, Big Pine Key









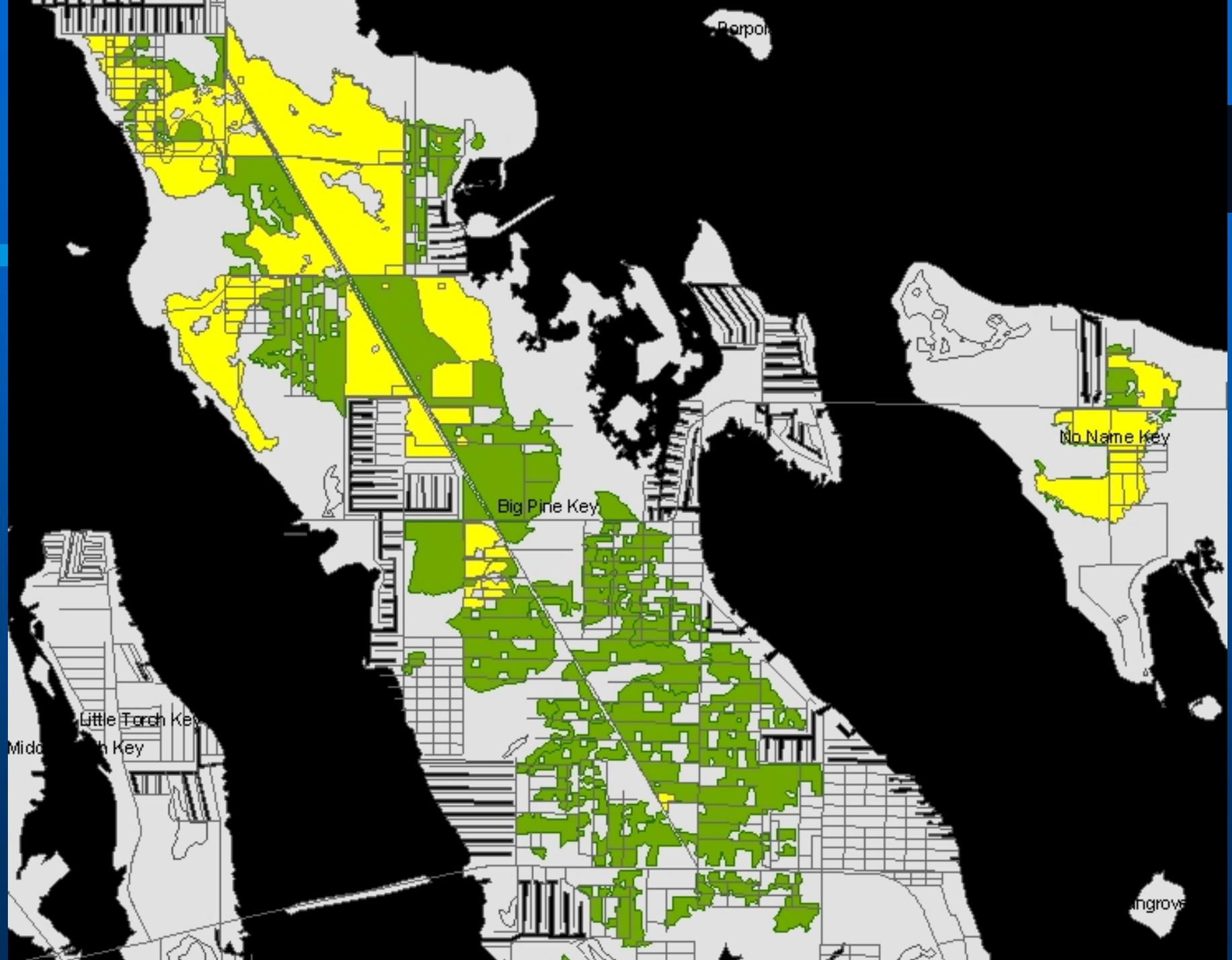
Little Pine Key

Barpo

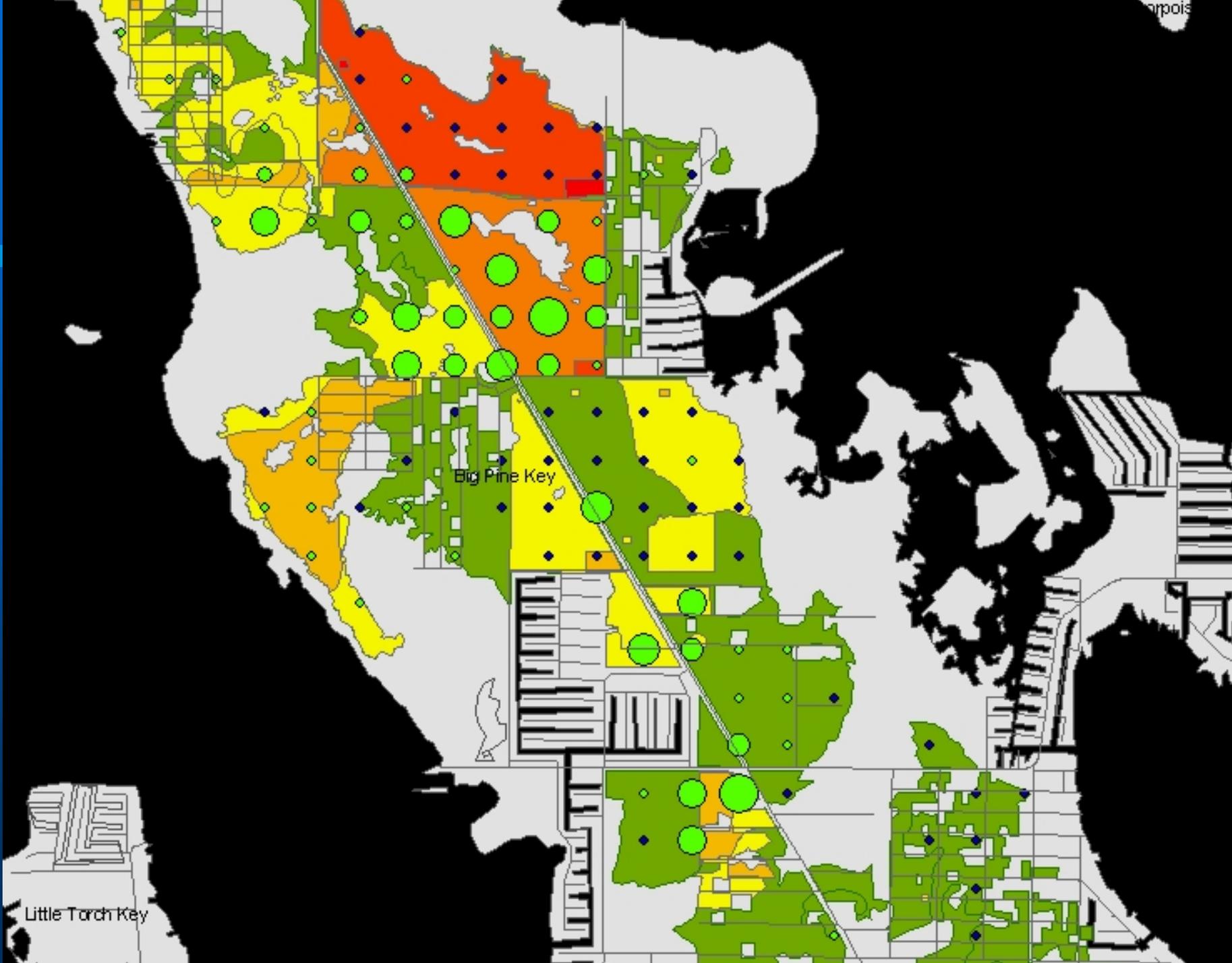
Big Pine Key

No Name Key

Little Torch Key

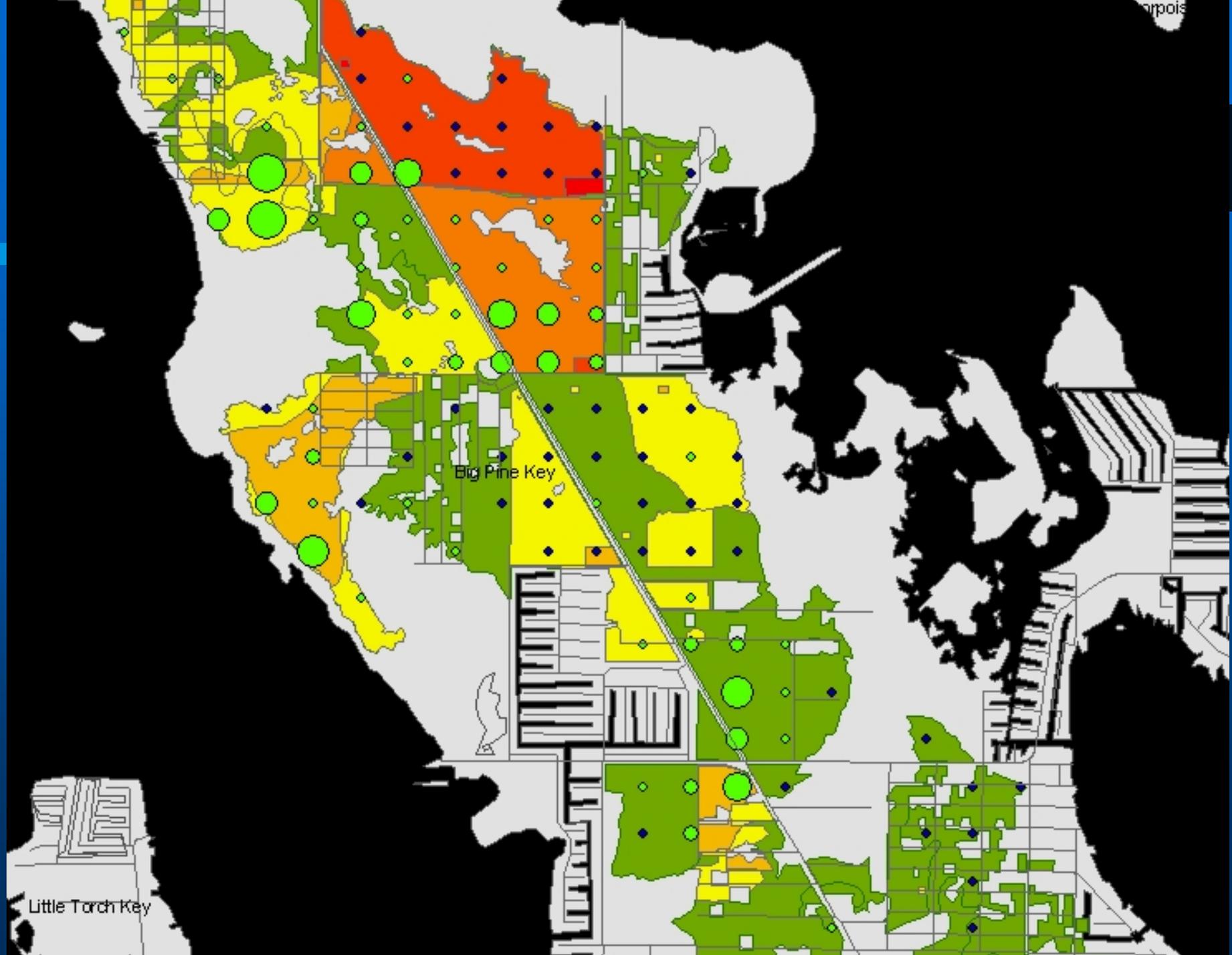




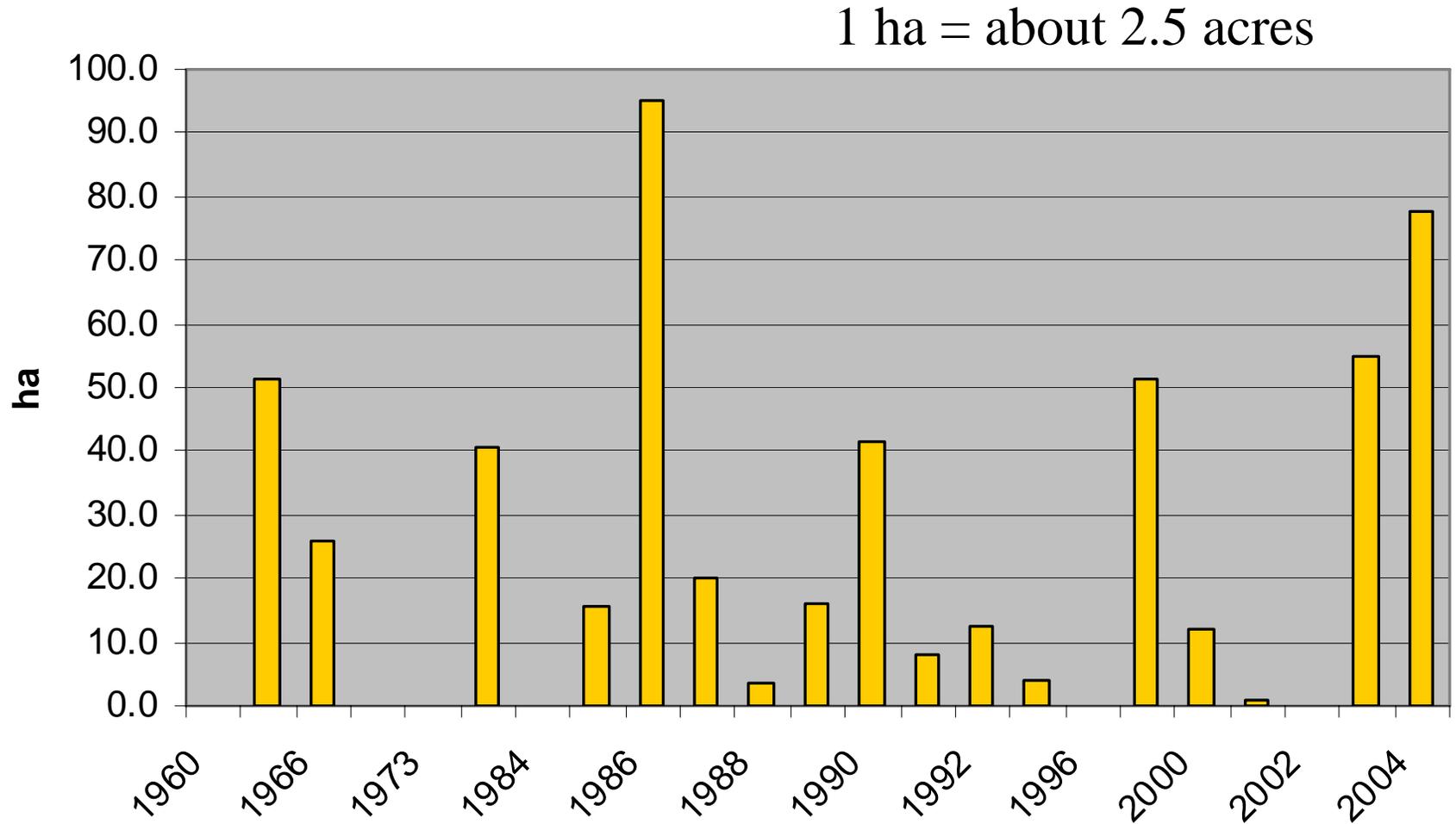


Big Pine Key

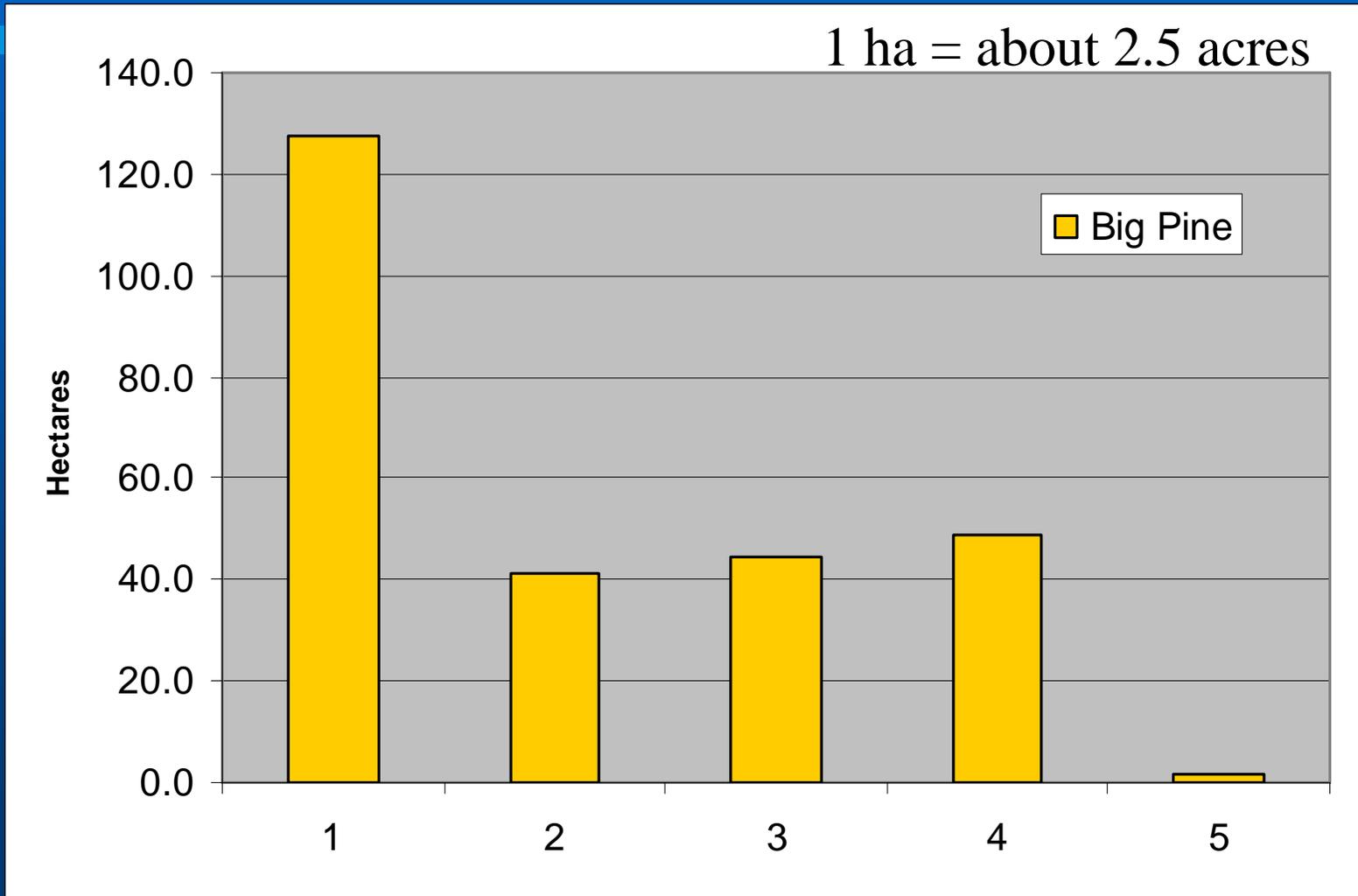
Little Torch Key



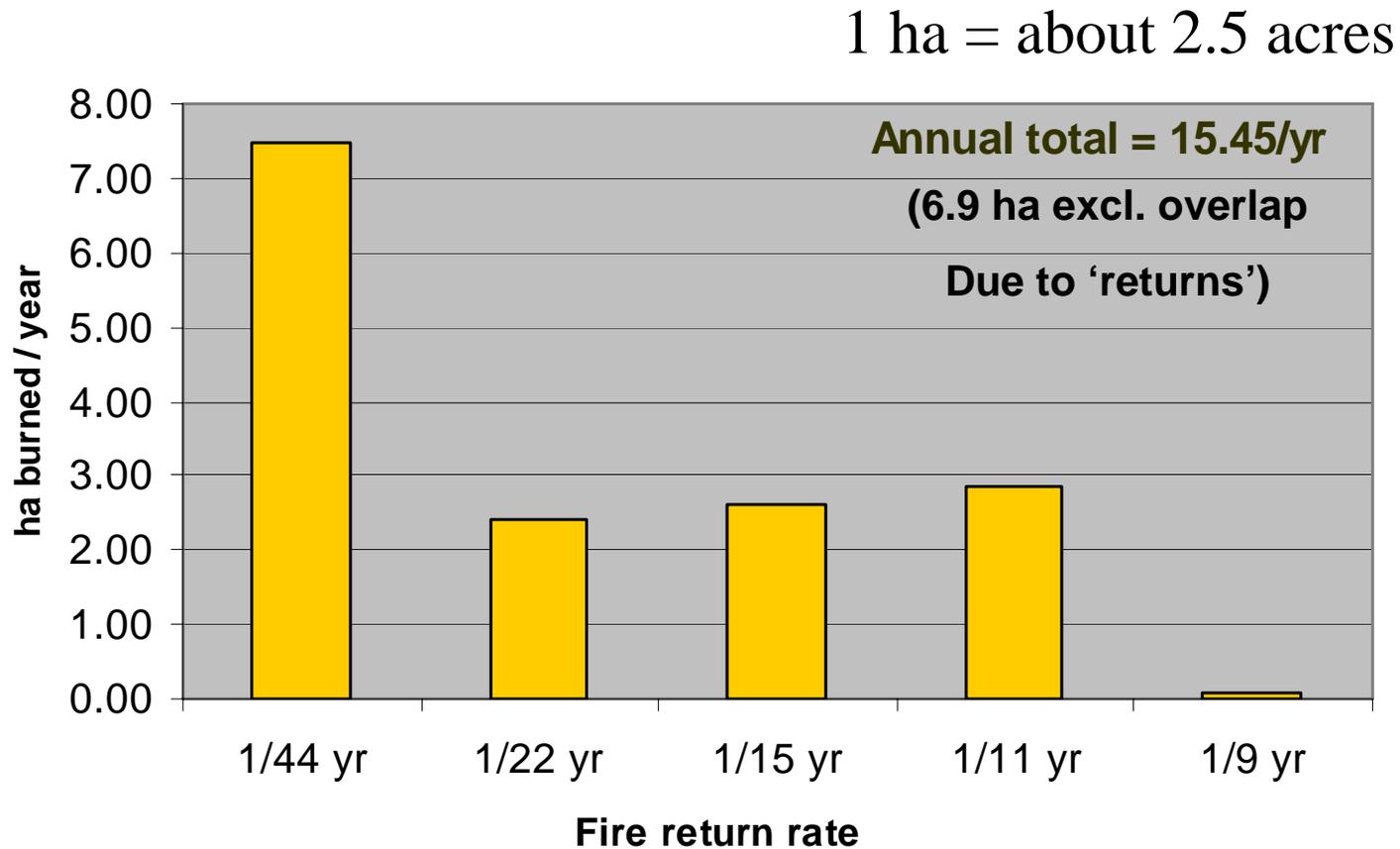
Fire history, Big Pine key



Fire return frequency since 1960, Big Pine key



Average area burned annually since 1960, by fire recurrence class, Big Pine key



Overall fire return intervals on Big Pine Key pine rocklands since 1960

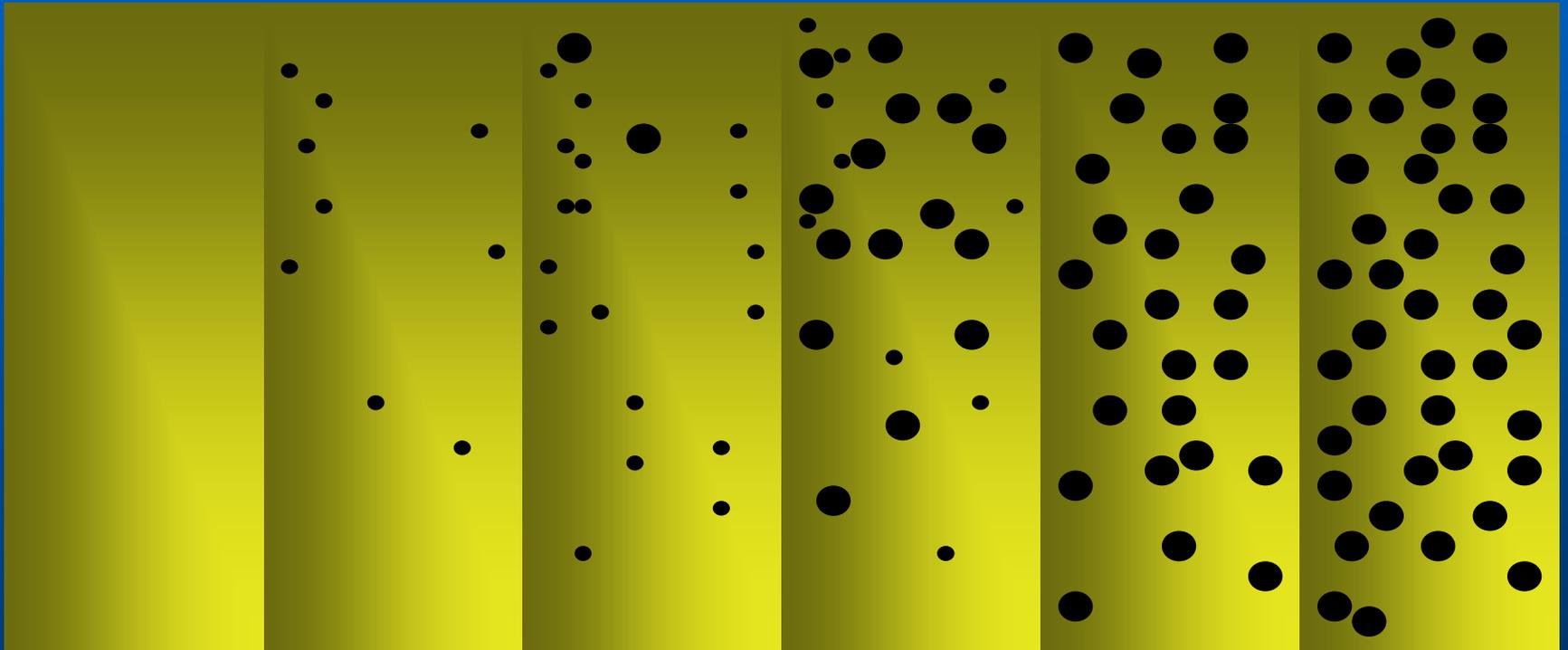
- In the areas that have been actively burned over the last 44 years (~264 ha), the average annual rate of burns yields a fire return interval of 34.4 years
- Extending the observed record to include all pine rockland on BPK (688 ha, including areas that never burned according to the data used [426 ha], the average annual rate of burns yields a fire return interval of 34.4 years
- (~264 ha),

Overall fire return intervals on Big Pine Key pine rocklands since 1960

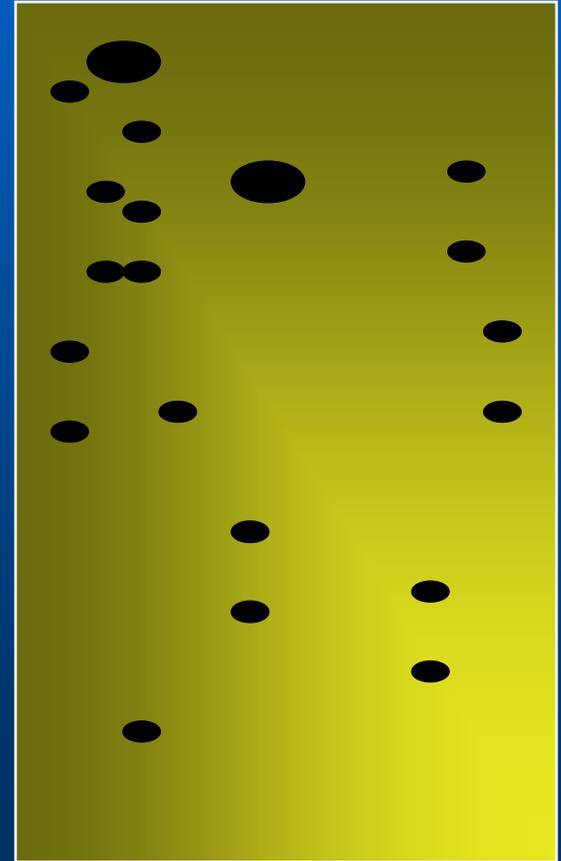
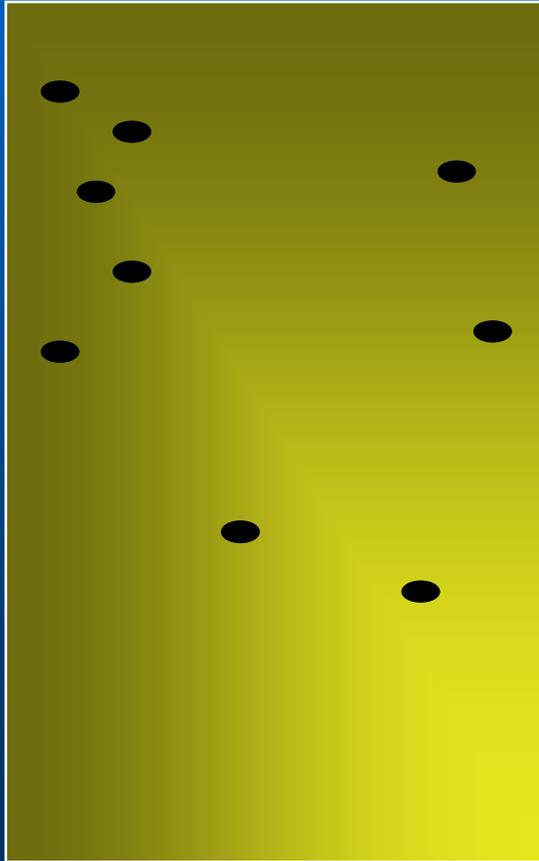
- For perspective, if the same annual burn rate was retained, but the partly overlapping distribution was scrapped (all sites were only burned one time), it would take about 44 years to cycle through all pine rockland on BPK once (688 ha; including areas that never burned according to the data used [426 ha]). To apply the same return frequency distribution used in the 'active area' would take 100 years.



Buttonwood gradients in transition habitats



Is the more open, herbaceous end of the woody transition missing?





17

71

82

60

102

170

177

12

8

9

175

16

153

156

152

161

157

155

174

171

7

173

24

23

176

15

20

21

172

19

18

14

22

160

169

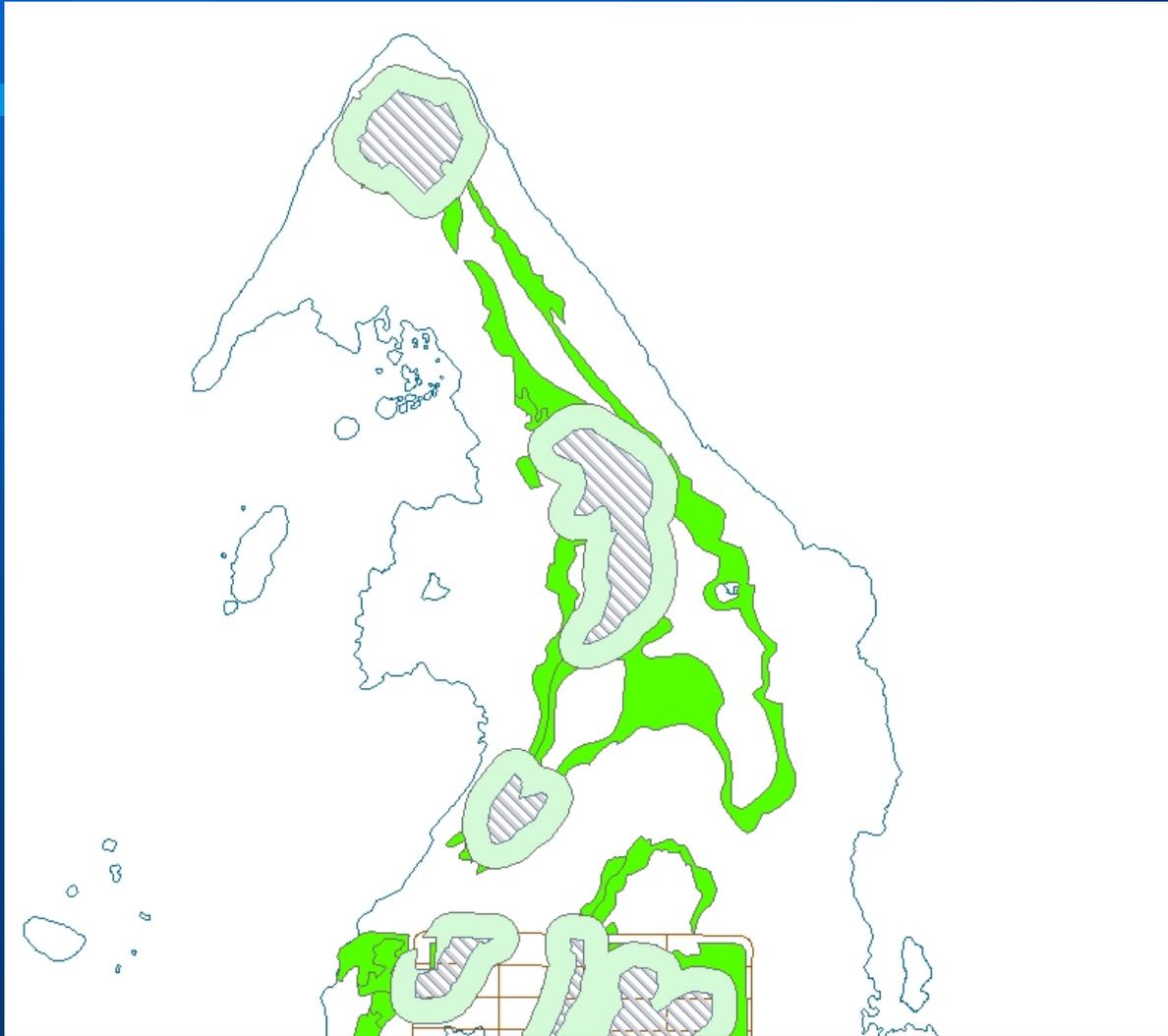
6

4



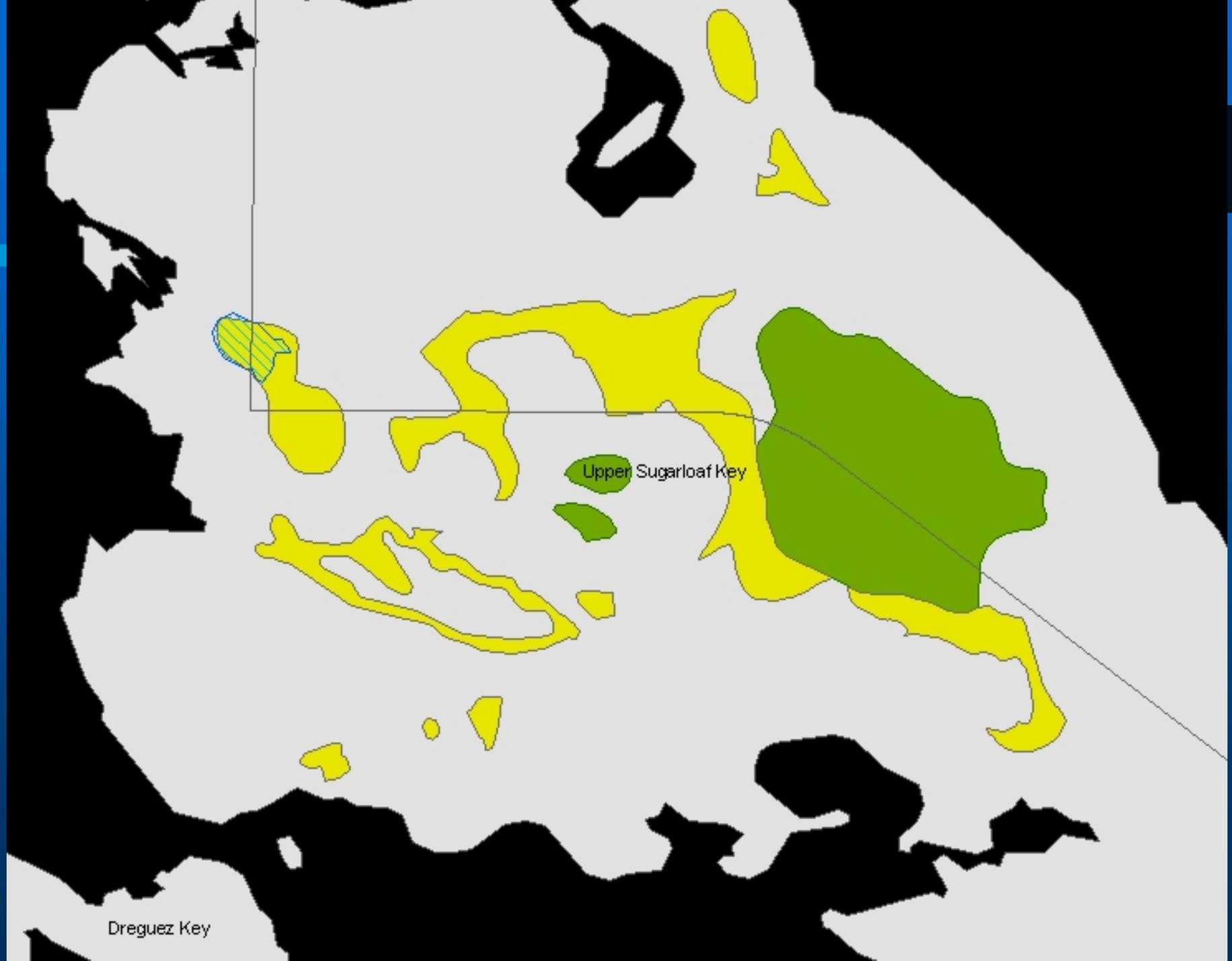


Lower Keys marsh rabbit



Corridors?

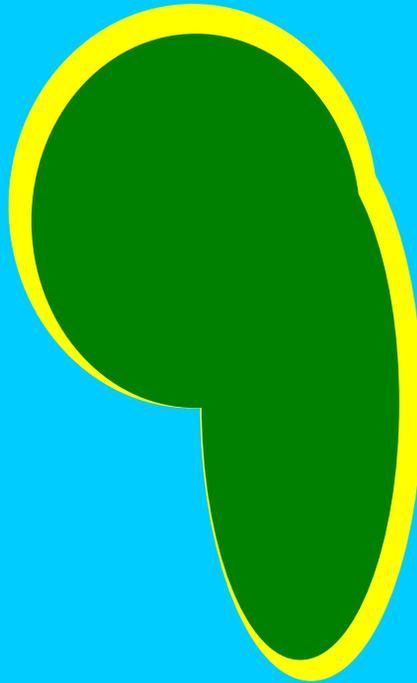
Or general
purpose
habitat of
the past?

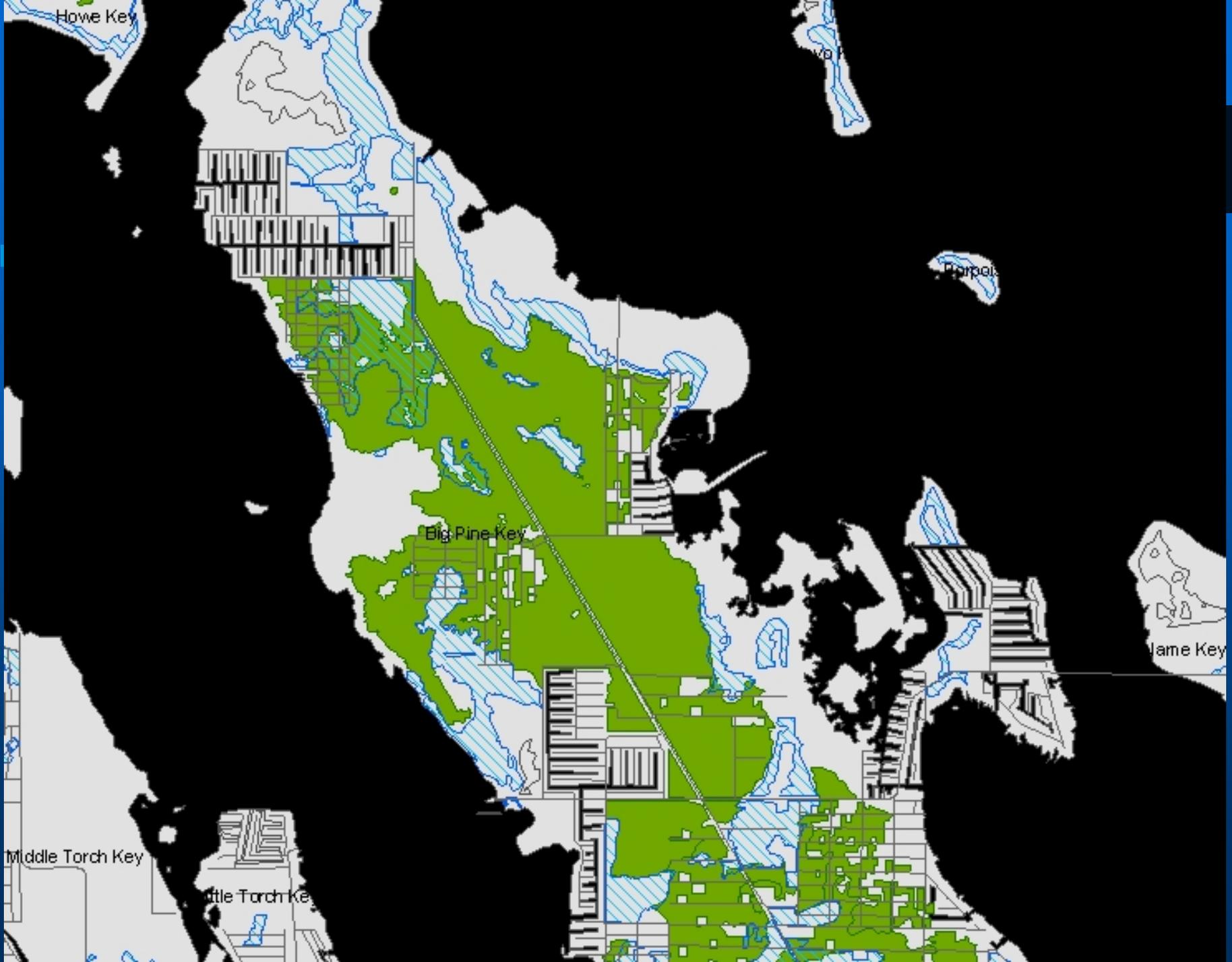


Upper Sugarloaf Key

Dreguez Key

Landscape patterns: legacies from the past





Howe Key

Parrot

Parrot

Big Pine Key

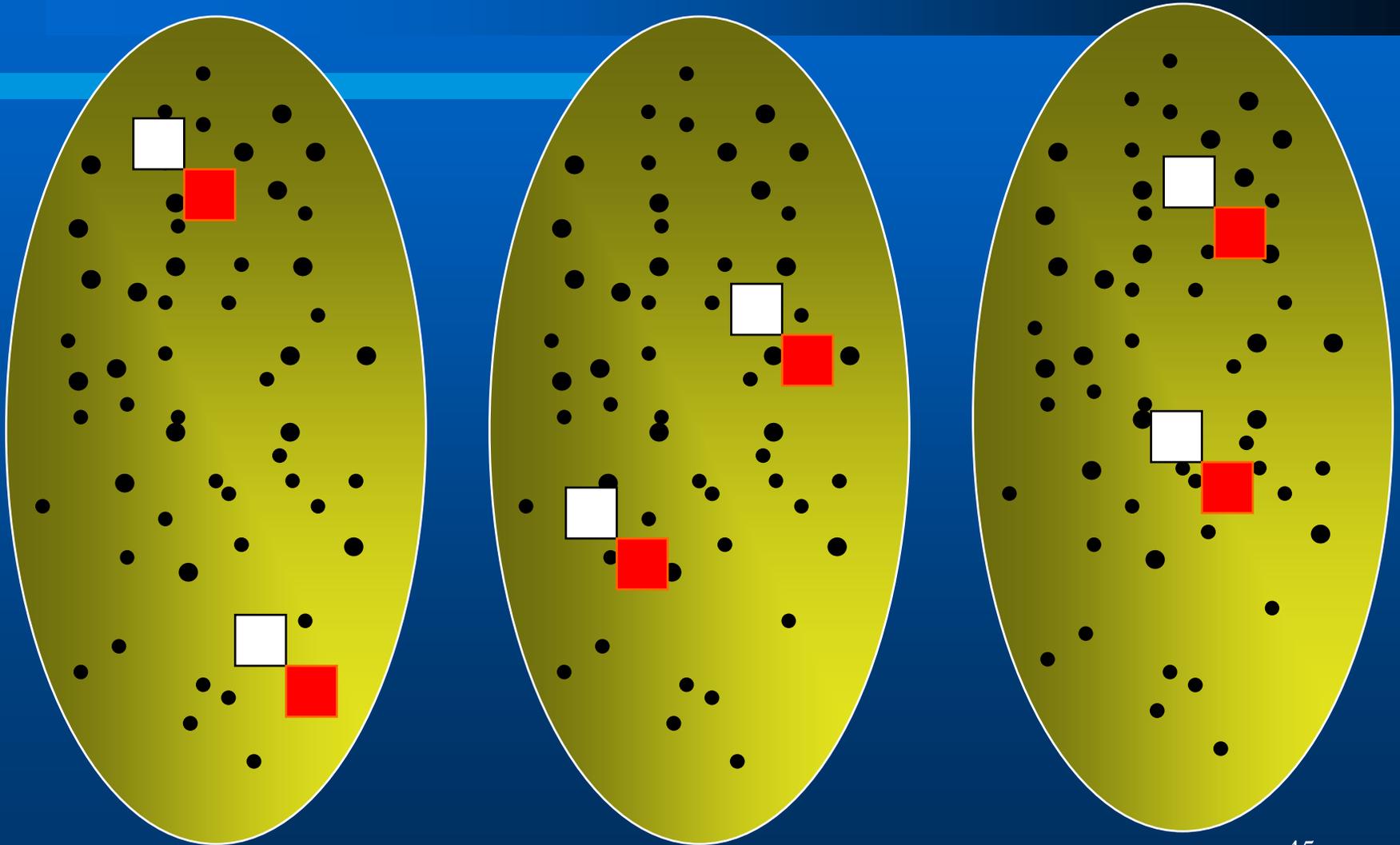
Jame Key

Middle Torch Key

Little Torch Key



Buttonwood transition habitats



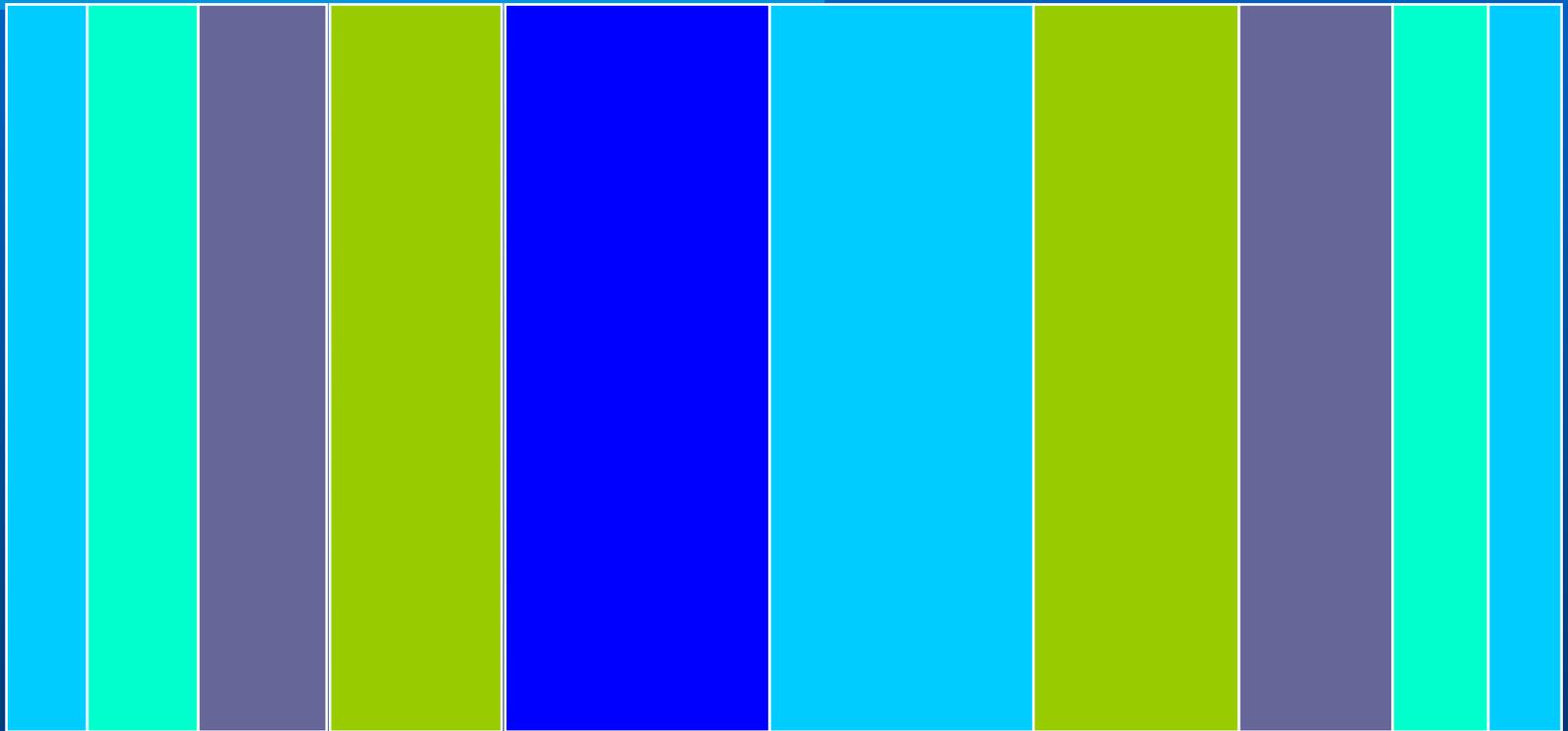
Ongoing studies







Habitat conditions and populations

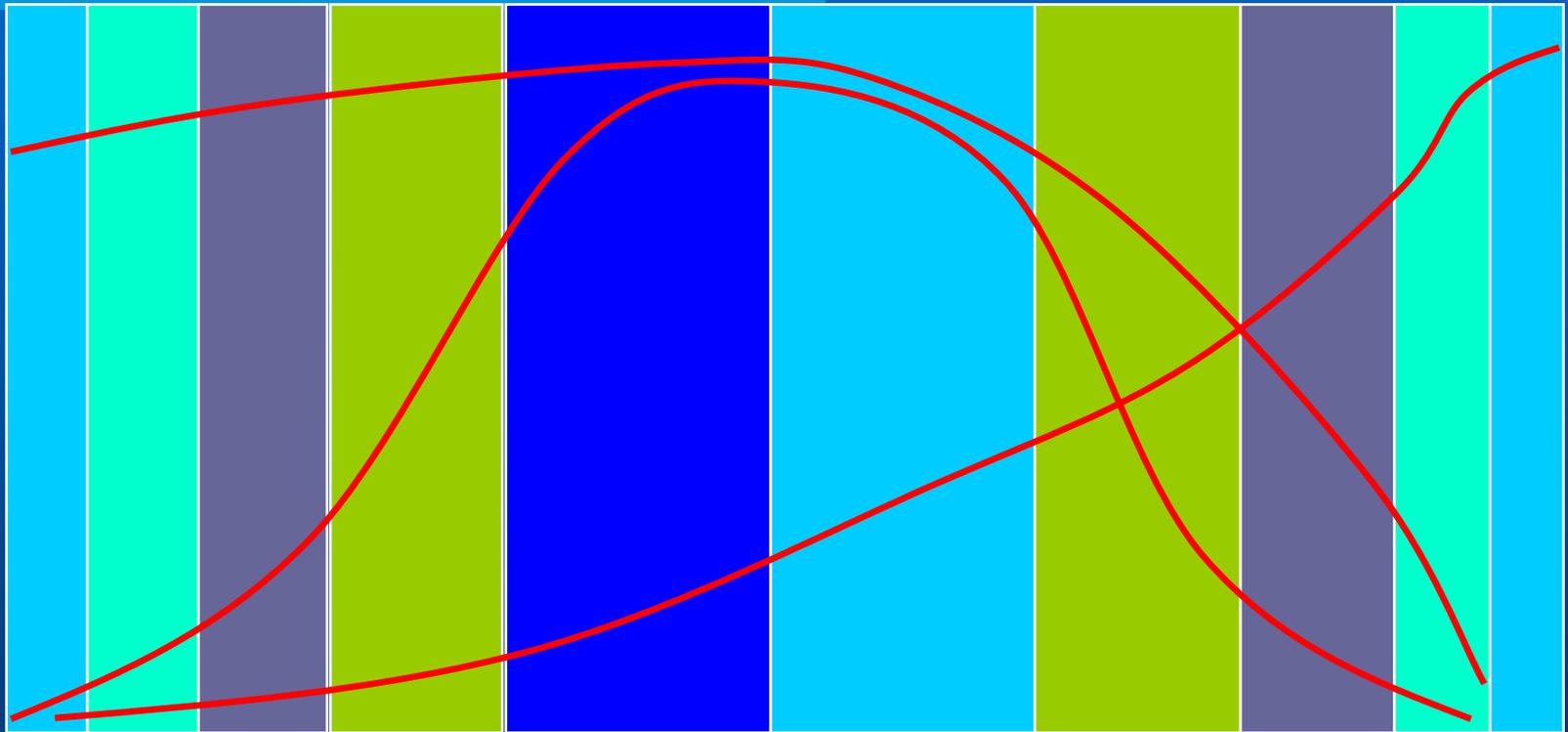


<< Long-rotation <<

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>> Short-rotation>>

Population response to the entire landscape

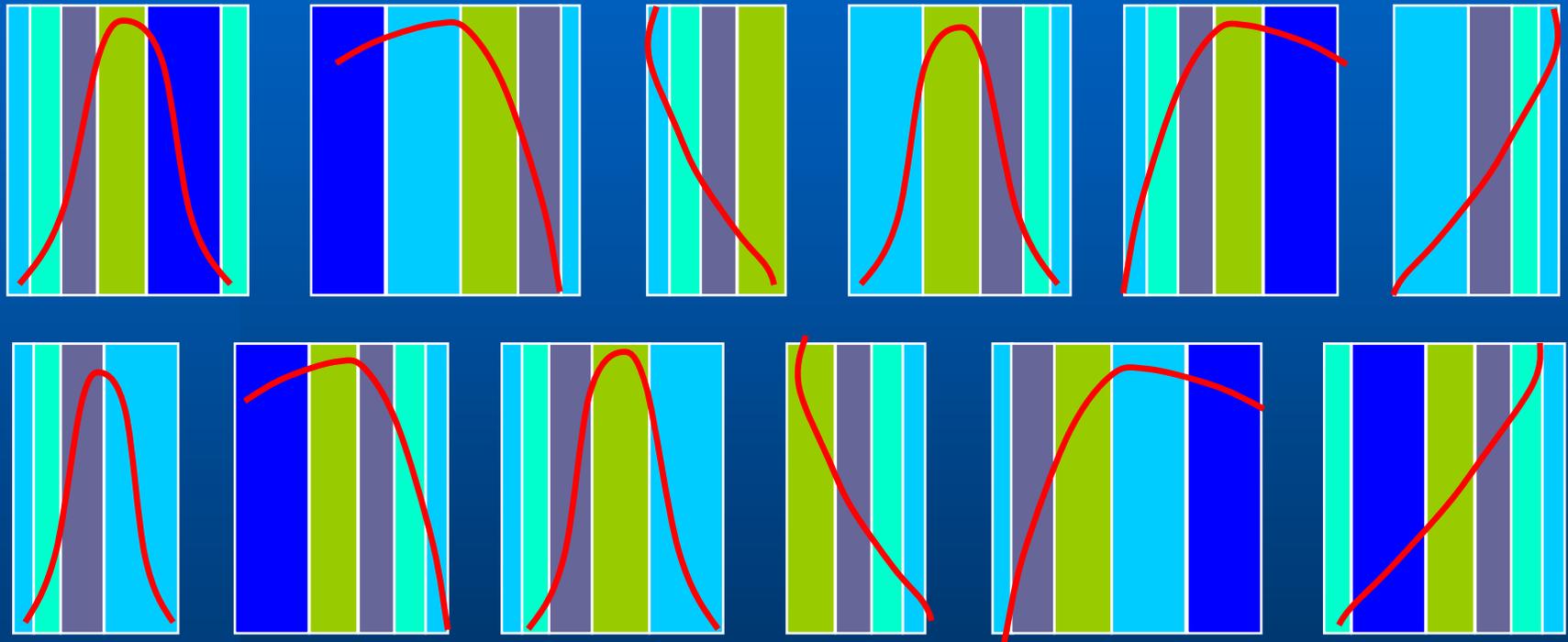


<< Long-rotation <<

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>> Short-rotation >>

Population response to the entire landscape



<< Long-rotation <<

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Thank you

