

Habitat Loss and the Florida Panther

Florida Panther Recovery Criteria Review Team

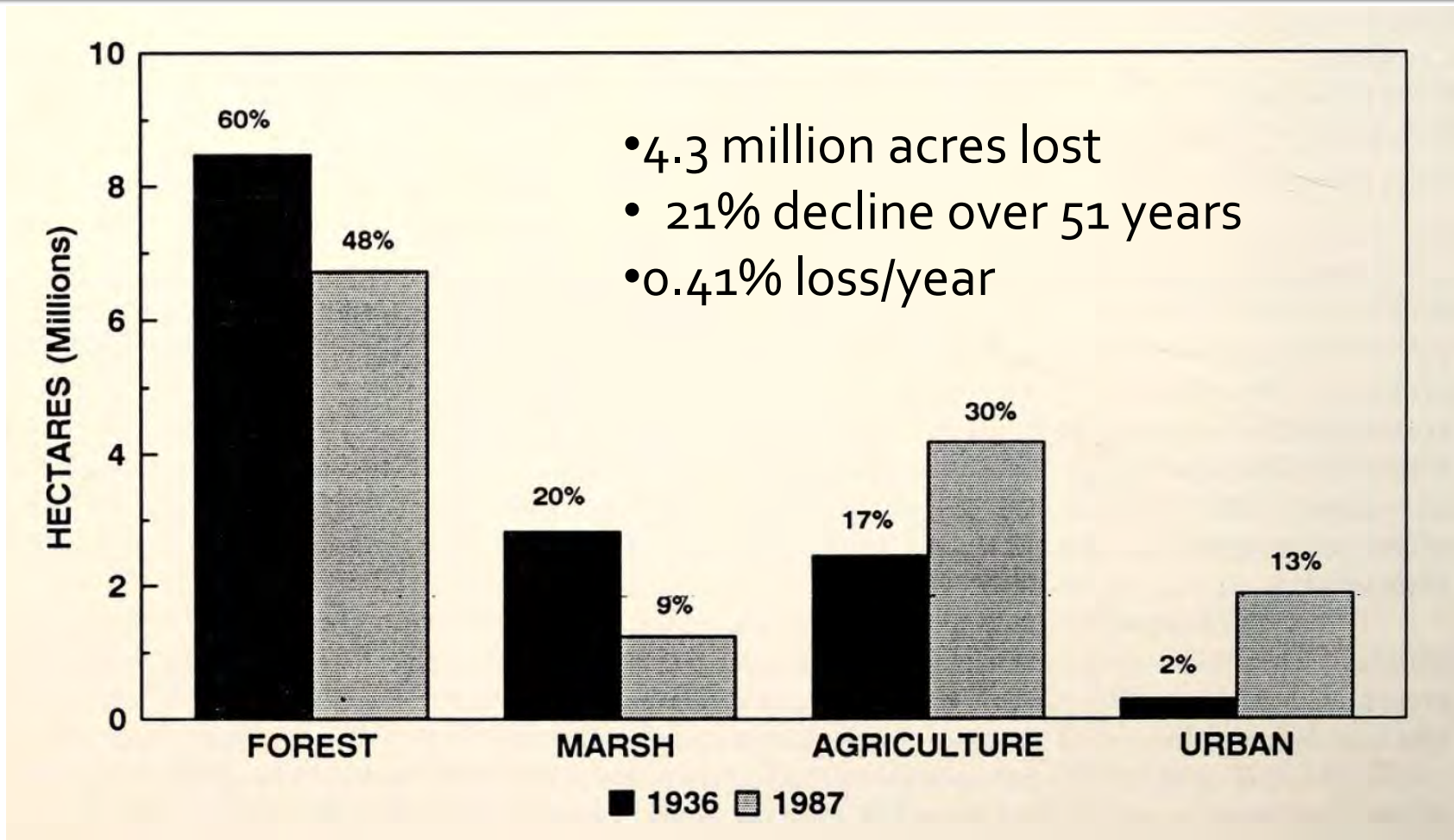
October 12, 2016

By: Randy Kautz

Habitat Loss Over Time

- Florida and South Florida: 1936-1987
- Statewide Change Detection: 1987-2003
- SFWMD Land Use/Land Cover: 1995-2008
- Cooperative Land Cover Data: 2003-2015
- Future Habitat Loss: Next 10-50 Years

Florida Forests 1936-1987

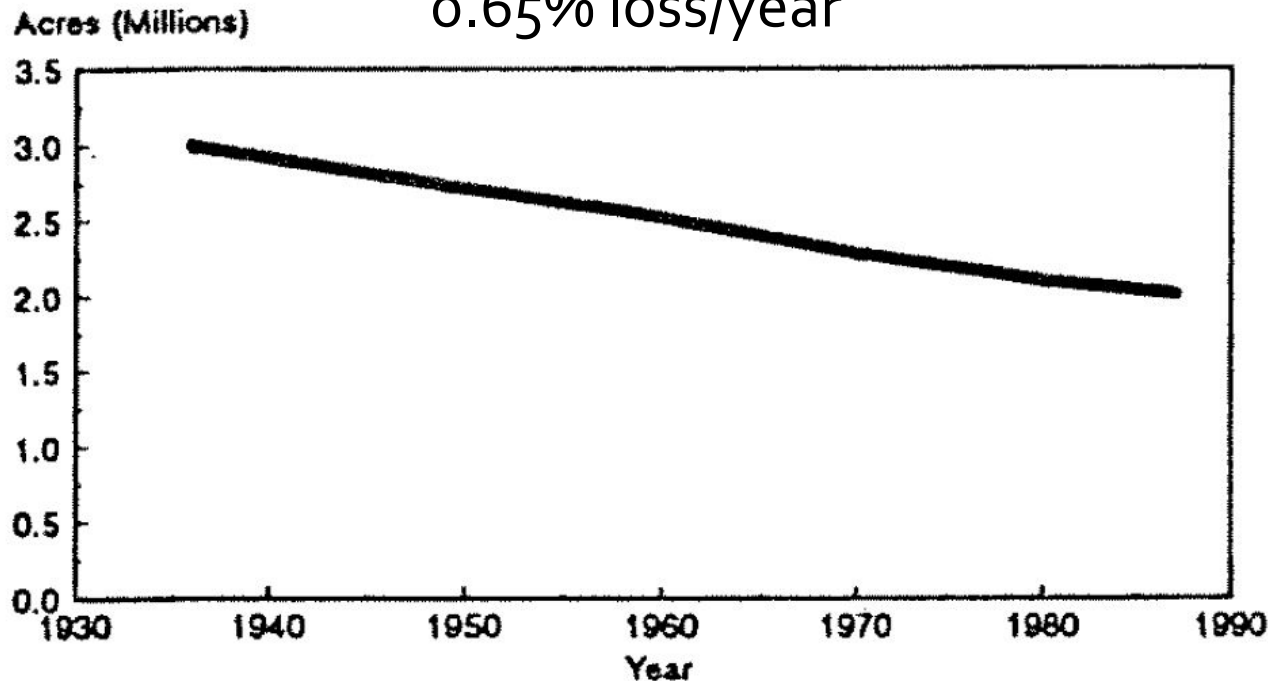


Source: Kautz, R. 1993. Trends in Florida wildlife habitat 1936-1987. Florida Scientist 56(1):7-22.
(Based on an analysis of USFS Forest Inventory Assessment data).

South Florida Forests 1936-1987

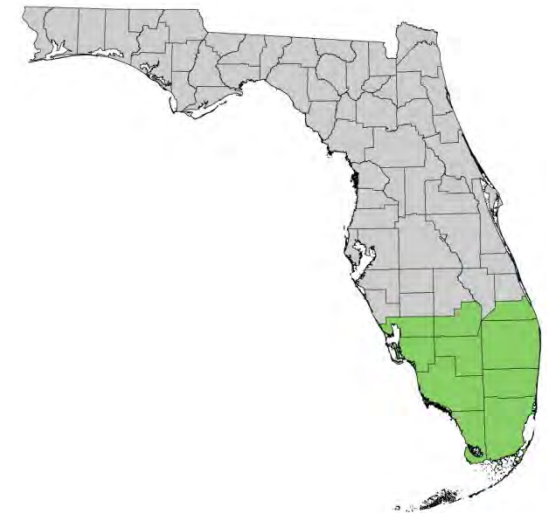
Forest Area in South Florida
33% Decline in 51 Years - 0.98 Million Acres
Lost

0.65% loss/year



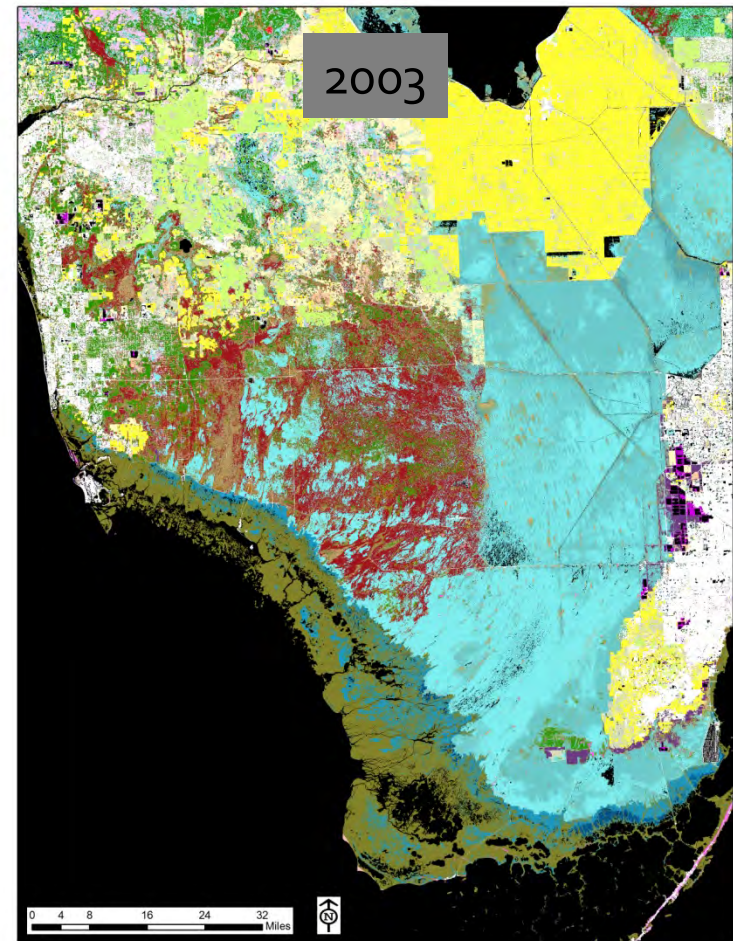
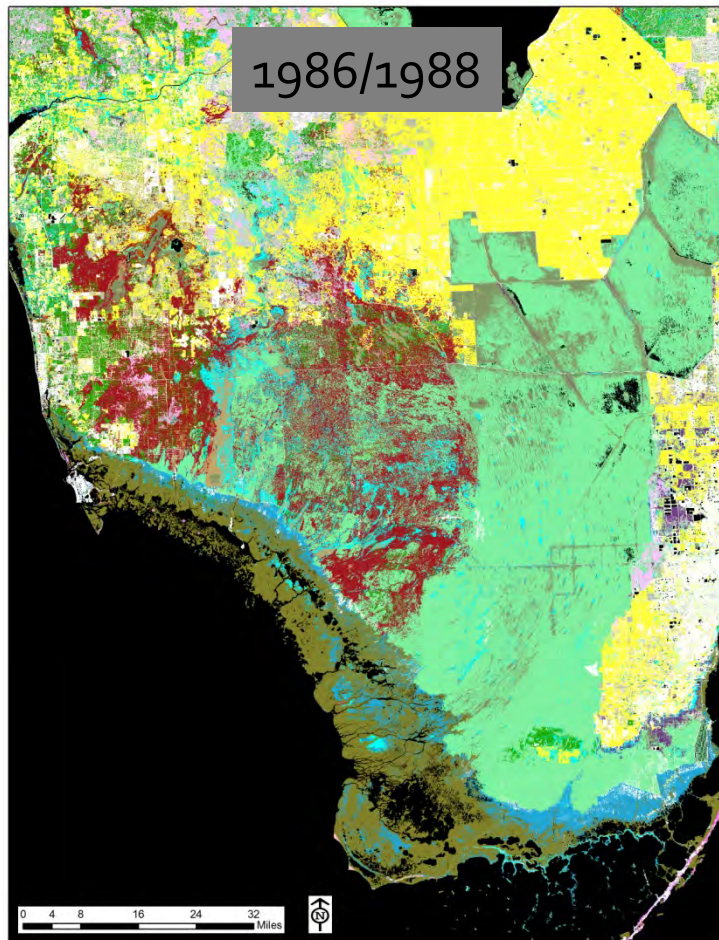
Ten Counties:

Charlotte, Glades, Lee,
Hendry, Collier, Martin,
Palm Beach, Broward,
Miami-Dade, Monroe



Source: Kautz, R. 1994. Historical trends within the range of the Florida panther. Pages 285-296 in Jordan, D. B., editor. Proceedings of the Florida panther conference. Florida Panther Society, Inc.

Change Detection 1986/88-2003



Source: Kautz, R., B. Stys, R. Kawula. 2007. Florida vegetation 2003 and land use change between 1985-89 and 2003. *Florida Scientist* 70(1):12-23.

Change Detection Classifications to Account for Differences in Dates

■ Natural Cover Types:

- Pinelands
- Forested Wetlands
- Upland Hardwoods
- Dry Prairie
- Shrub and Brushland
- Shrub Swamp
- Freshwater Marsh and Wet Prairie
- Scrub
- Coastal Salt Marsh
- Mangroves

■ Conversion Classes:

- Natural to Agriculture
- Natural to Urban/Developed
- Agriculture to Urban/Developed
- Natural to Water

**Primary Zone
1986/88-2003**

Change Type	Acres
Natural to Agriculture	55,883
Natural to Developed	3,952
Agriculture to Developed	11,745
Natural to Water	30,744
Total Change	102,324
Loss of Natural Habitat	90,579

0.28% loss of natural
habitats per year

0 3 6 12 18 24
Miles



- Primary Zone
- Conservation Lands
- Water
- Change Detection 1987-2003**
- Agriculture to Urban/Developed
- Natural to Agriculture
- Natural to Urban/Developed
- Natural to Water

SFWMD Land Use 1995-2008

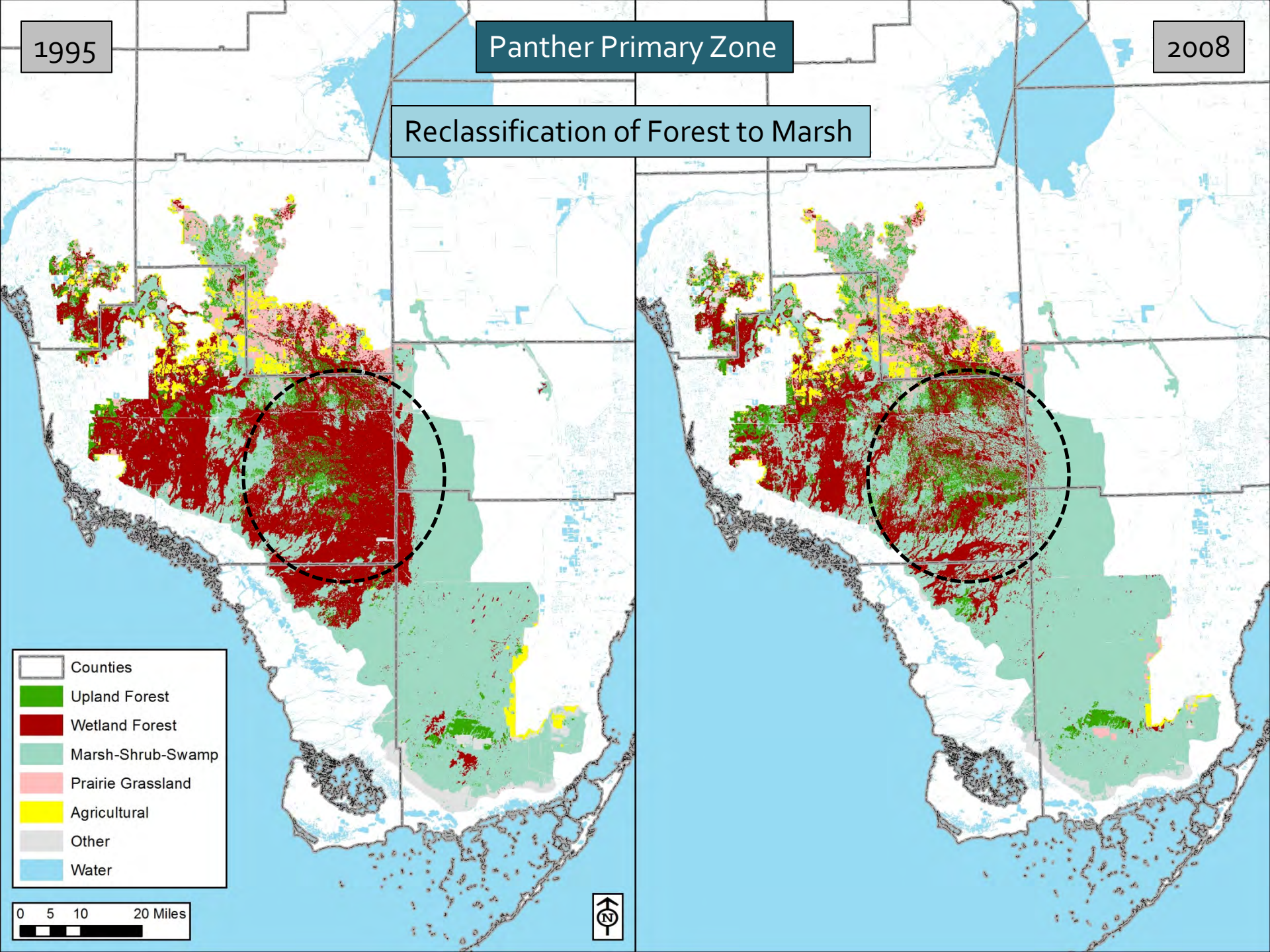
- South Florida Water Management District Land Use/Land Cover Data: 1995 and 2008
- Methods:
 - FLUCCFS codes for each date reclassified to USFWS panther cover types
 - Panther scores applied to cover types
 - Each date clipped to Primary Zone and Adult Breeding Habitat (Frakes et al. 2015)
 - Gains and losses in acreages compared
 - Changes in PHUs compared to assess habitat degradation
- Source: Randy Kautz, unpublished data

1995

Panther Primary Zone

2008

Reclassification of Forest to Marsh

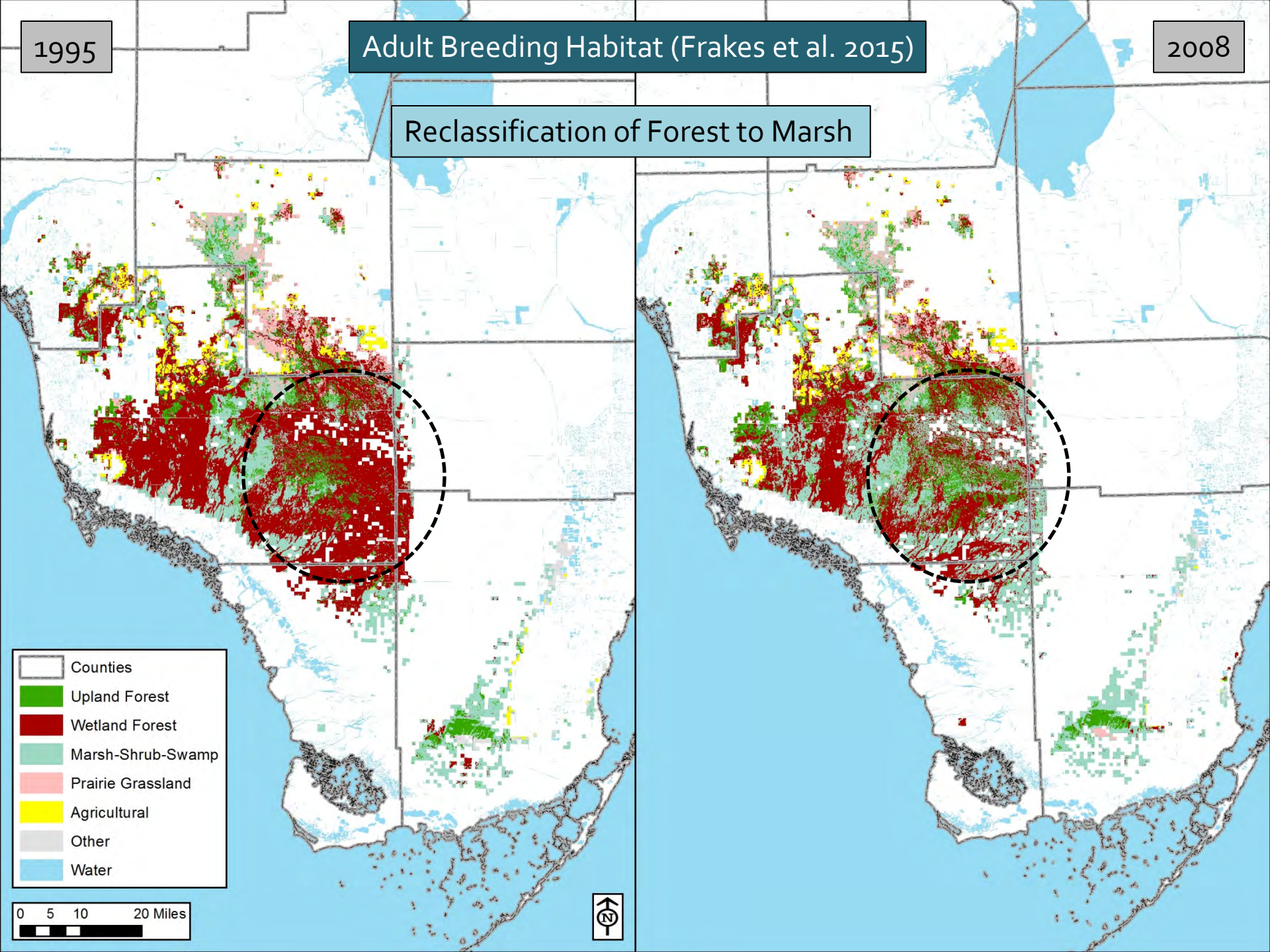


1995

Adult Breeding Habitat (Frakes et al. 2015)

2008

Reclassification of Forest to Marsh



Results from SFWMD 1995-2008

Florida Panther Primary Zone (0.26% loss of natural habitat/year)

Onorato et al (2011) Major Cover Types	1995		2008		Difference		% Change/Year	
	Acres	PHU	Acres	PHU	Acres	PHU	Acres	PHU
Upland Forest	160,984	1,518,984	202,070	1,897,652	41,086	378,669	1.96	1.92
Wetland Forest	738,416	6,793,427	474,874	4,368,839	-263,542	-2,424,588	-2.75	-2.75
Prairie Grassland	133,539	730,814	147,928	824,285	14,389	93,470	0.83	0.98
Marsh-Shrub-Swamp	1,057,145	5,074,288	1,300,029	6,365,500	242,884	1,291,212	1.77	1.96
Agricultural	92,757	442,296	72,287	344,228	-20,470	-98,068	-1.70	-1.71
Other	87,575	207,245	73,229	144,322	-14,346	-62,923	-1.26	-2.34
Total	2,270,416	14,767,054	2,270,417	13,944,826	-	-	-	-

Adult Breeding Habitat (Frakes et al. 2015) (0.11% loss of natural habitat/year)

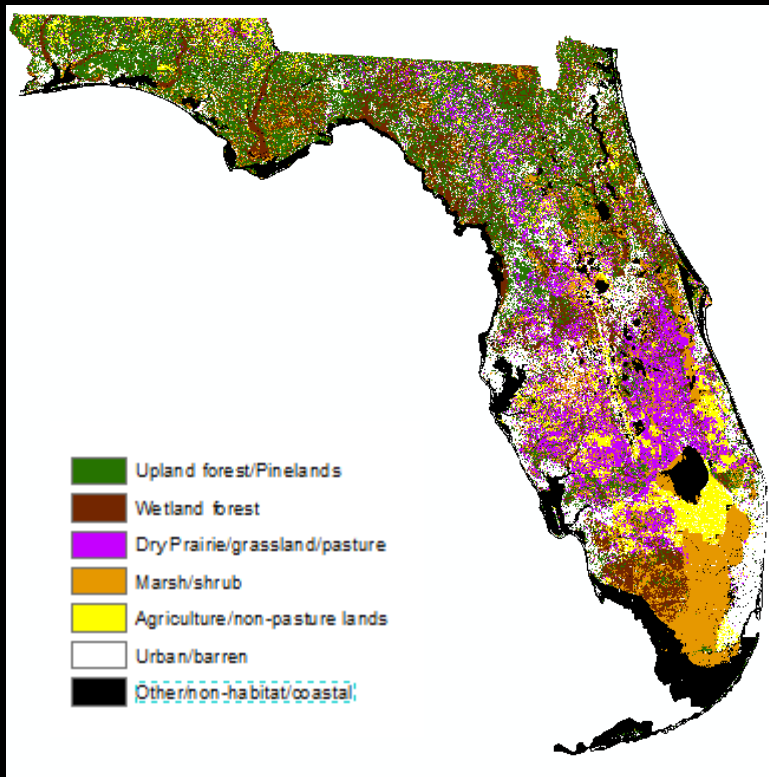
Onorato et al (2011) Major Cover Types	1995		2008		Difference		% Change/Year	
	Acres	PHU	Acres	PHU	Acres	PHU	Acres	PHU
Upland Forest	145,758	1,375,153	187,518	1,761,724	41,759	386,571	2.20	2.16
Wetland Forest	656,079	6,035,928	449,101	4,131,729	-206,978	-1,904,199	-2.43	-2.43
Prairie Grassland	102,004	562,980	109,396	610,158	7,392	47,179	0.56	0.64
Marsh-Shrub-Swamp	376,794	1,832,553	556,361	2,805,305	179,567	972,751	3.67	4.08
Agricultural	58,582	278,941	48,636	231,372	-9,945	-47,569	-1.31	-1.31
Other	39,239	85,853	27,464	49,965	-11,775	-35,888	-2.31	-3.22
Total	1,378,456	10,171,408	1,378,476	9,590,254				

Cooperative Land Cover 2003-2015

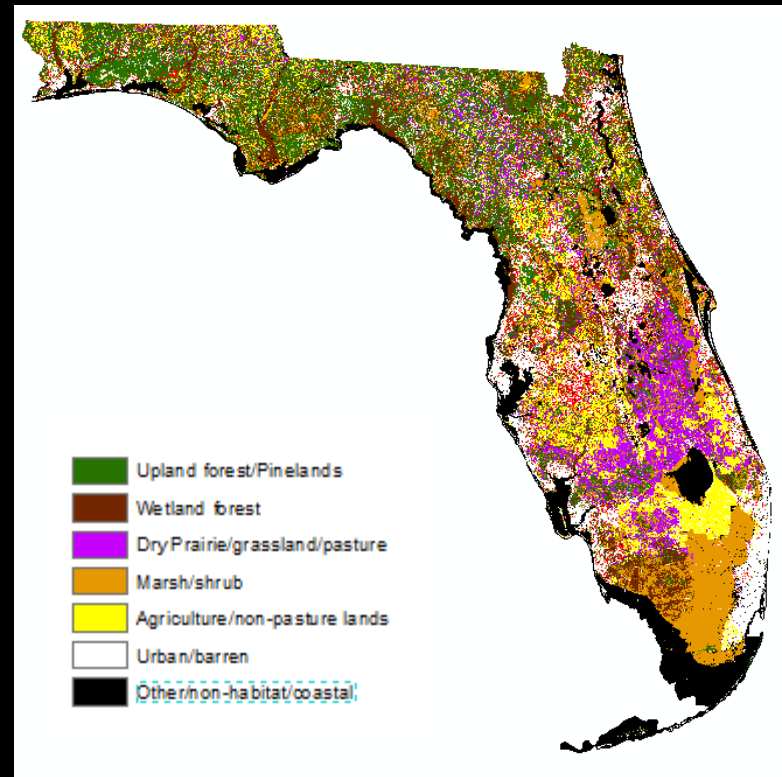
- Analyses by Dr. Robert Kawula (FWC)
- Presented to Panther Recovery Implementation Team Meeting April 2016
- Compares FWC 2003 Land Cover Data with Cooperative Land Cover Data for 2015
- Primary, Secondary, and Dispersal Zones

Panther Habitat Reclassification

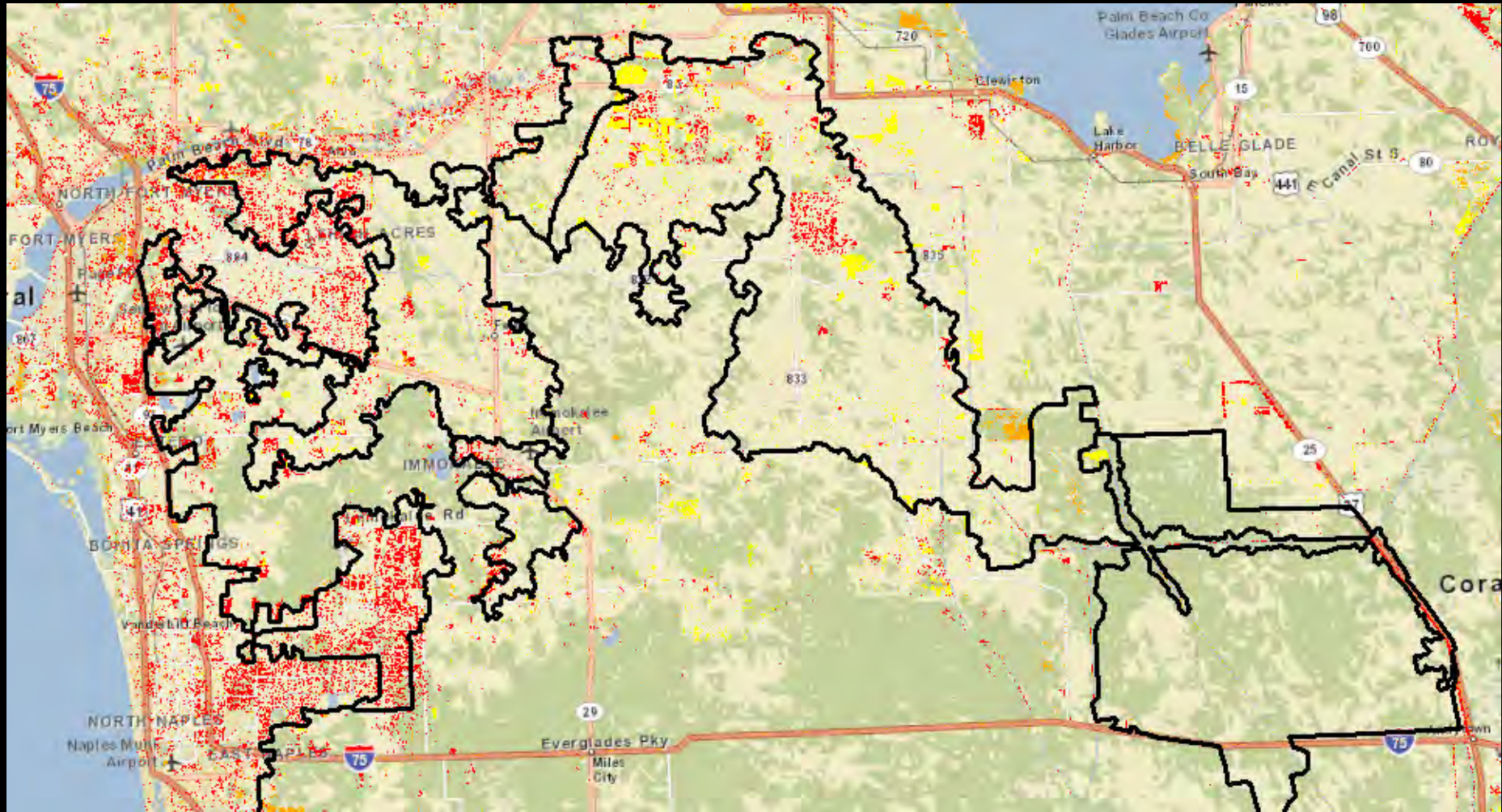
FWC 2003



CLC



Habitat Change (2003-2015)



Natural Habitat → Agriculture (non-pasture) Natural Habitat → Urban/Developed Natural Habitat → Other Non-habitat

Difference between 2003 and current CLC 2015 (ac)

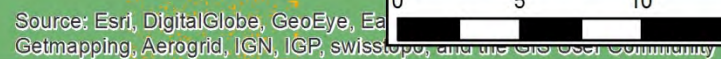
Habitat Type	Primary	Secondary	Dispersal	Total difference
Upland Forest	-23372	-12480	-526	-36377
Wetland Forest	-136677	-3433	594	-139517
Open grassland/pasture	1737	-25331	306	-23288
Marsh/shrub/scrub	130613	3333	-215	133731
Agriculture	288	297	-256	330
Urban/developed	15035	31953	-773	46215
Other	12376	5661	-182	17855

Primary Zone: 0.06% loss of natural habitat/year

Primary, Secondary, and Dispersal Zones: 0.15% loss of natural habitat/year

Future Loss of Panther Habitat

- Proposed Developments on the Books
 - Developments of Regional Impact (DRI)
 - Planned Unit Developments (PUD)
 - Sector Plans
 - Habitat Conservation Plan (East Collier RLSA)
- Methods
 - Union development shape files with PFA
 - Calculate area lost to future development by zone
 - Estimate panther impacts using density estimates
- Randy Kautz, unpublished data



Estimated Future Habitat Loss

Estimates of Florida Panther Density

Sources	Panther Density	
	Ha	Acres
Maehr et al (1991)	11,000	27,181
Sollmann et al (2013)	6,135	15,160
Sollmann et al (2013)	6,024	14,866

Panther Habitat Lost to Development and Estimated Impact on Population

Zone	Total Acres	Proposed Development		Panthers Lost to Development*	Estimated Population*	% Loss
		Acres	% of Zone	No.	No.	
Primary Zone	2,270,417	69,872	3.1	4.7	153	3.1
Secondary Zone	812,045	99,725	12.3	6.7	6	-
Dispersal Zone	27,879	2,630	9.4	0.2	0.2	-

*Estimated based on panther density of one panther per 14,866 acres (Sollmann et al. 2013)

Habitat Loss Summary

- Habitat Has Been and Continues to Be Lost
 - 1936-1987 (USFS Data)
 - Florida: 4.3 M acres of forest lost (21% decline; 0.41%/year)
 - South Florida: 0.98 M acres lost (33% decline; 0.65%/year)
 - 1987-2015 (FWC and SFWMD Data)
 - ~118,300 acres of natural habitat converted to agriculture or urban in Primary Zone (0.11%-0.28% loss of natural habitats/year)
 - Most areas converted to agriculture, not urban development
 - Classification problems: wetland forest in older data sets classified as herbaceous wetlands suggest greater loss of forest cover than actually occurred
- Future Loss of Habitat
 - Developments currently on the books could result in the loss of 172,200 acres of Primary, Secondary, and Dispersal Zone habitat
 - That loss habitat could reduce the carrying capacity of the Primary Zone by as many as 4-5 panthers
 - Equivalent of 3% of Primary Zone population