

NAOYA MORISHITA

**LAND CHANGES IN FORMER ACTIVITY AREA
OF BLACK BEARS IN SOUTHERN FLORIDA**

LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

TABLE OF CONTENTS

- ▶ Introduction
- ▶ Methods
- ▶ Results
- ▶ Discussion&Conclusion
- ▶ Reference

TABLE OF CONTENTS

- ▶ Introduction
- ▶ Methods
- ▶ Results
- ▶ Discussion&Conclusion
- ▶ Reference

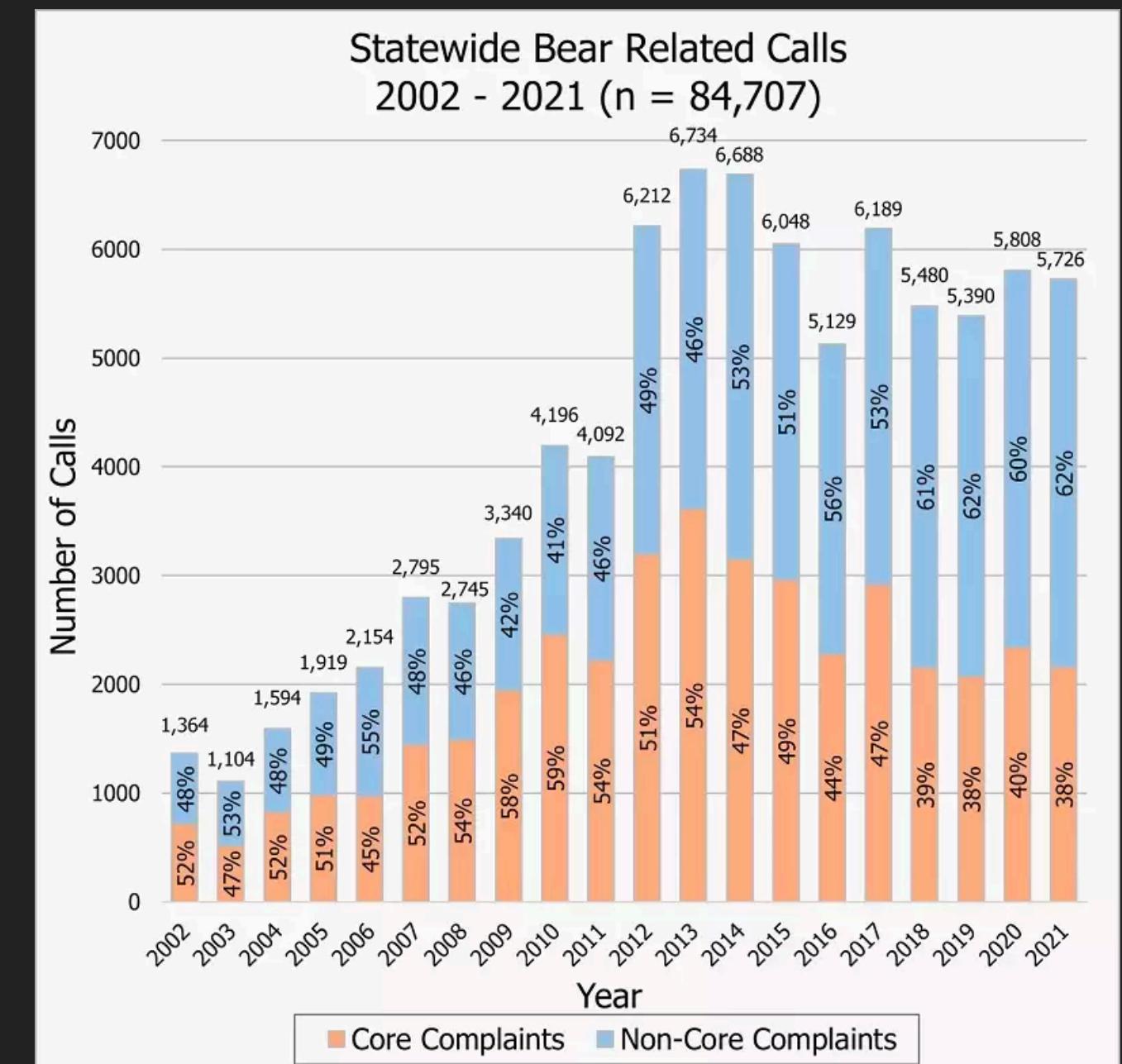
BACKGROUNDS

- ▶ Human's demand for space increase -> Human- Animal Conflict
- ▶ Even life loss both of animals and humans (and their livelihood)
- ▶ World Wildlife Fund "What is human-wildlife conflict and why is it more than just a conservation concern?" (Accessed on 07 Dec 2022) <https://www.worldwildlife.org/stories/what-is-human-wildlife-conflict-and-why-is-it-more-than-just-a-conservation-concern#:~:text=Why%20is%20human-wildlife%20conflict,to%20increased%20human-wildlife%20conflict>

LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

BACKGROUNDS

- ▶ In Florida, Bear Related Call had increased (2002~2021)
 - ▶ Core Complaints: Interaction
 - ▶ Non-Core Complaints: Unsure interaction or not



Retrieved from Florida Fish and Wildlife Conservation Commission "Bears by the Numbers"<https://myfwc.com/wildlifehabitats/wildlife/bear/numbers/>
(Downloaded on 07 Dec 2022)

LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

QUESTION

- ▶ Has the human's land use expanded into bears' home?
- ▶ How the land uses changed within former activity areas of black bears?
 - ▶ Could be used for preview of the development by the government
- ▶ 95% MCP home range analysis using Telemetry Data

TABLE OF CONTENTS

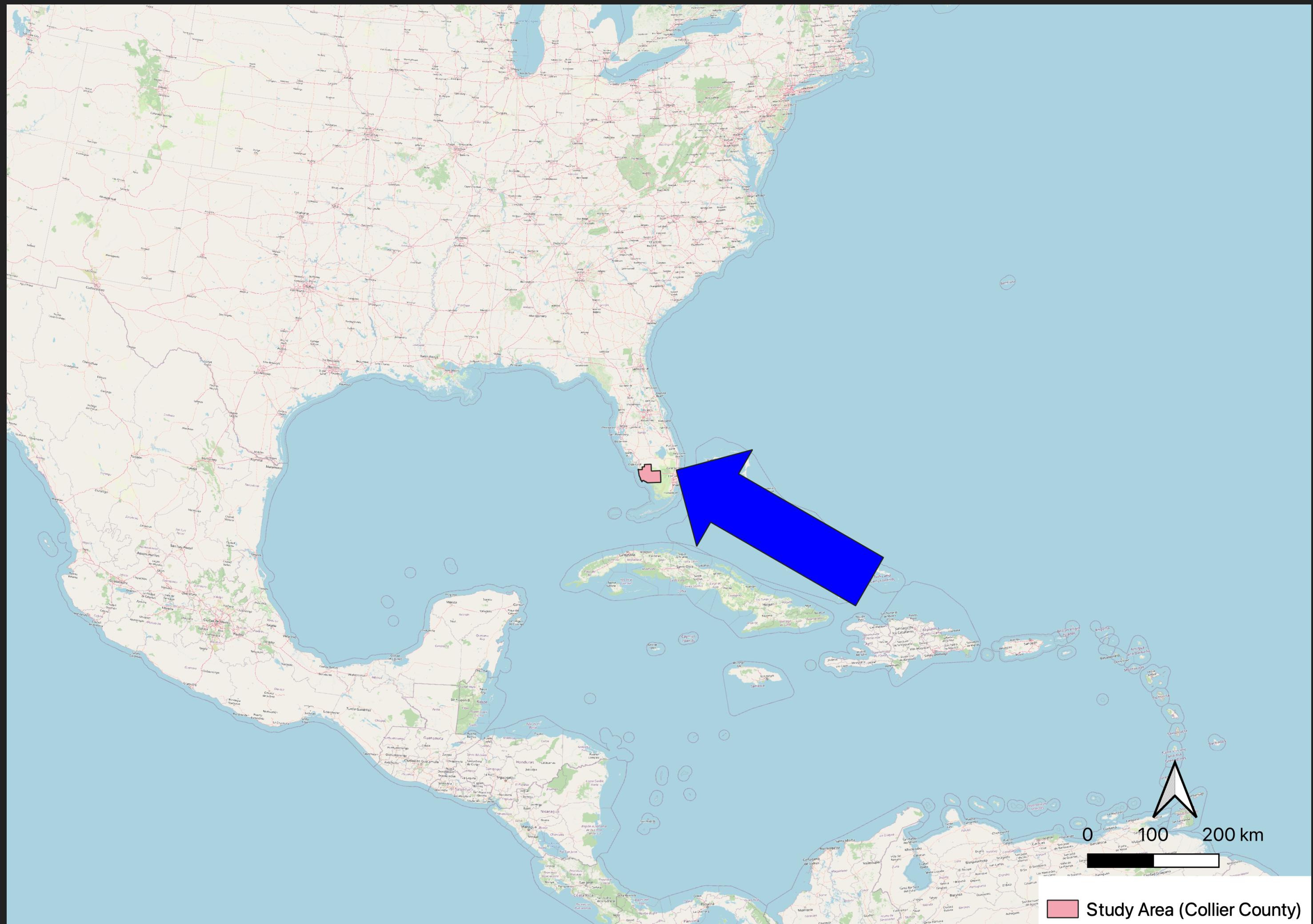
- ▶ Introduction
- ▶ Methods
- ▶ Results
- ▶ Discussion&Conclusion
- ▶ Reference

DATASET & RESOURCE

- ▶ Black Bear Telemetry Data in 1986- 1998
- ▶ Land Use(LU) and Land Change (LC) Data in 1995
- ▶ LU LC Data in 2014-2016
- ▶ County Boundary Data
 - ▶ All Downloaded from Florida's Geospatial Open Data on 30 Nov 2022 (<https://geodata.floridagio.gov>)
- ▶ Base Map: Open Street Map (<https://www.openstreetmap.org/>)
- ▶ Software: QGIS 3.28 & Python 3.11.1

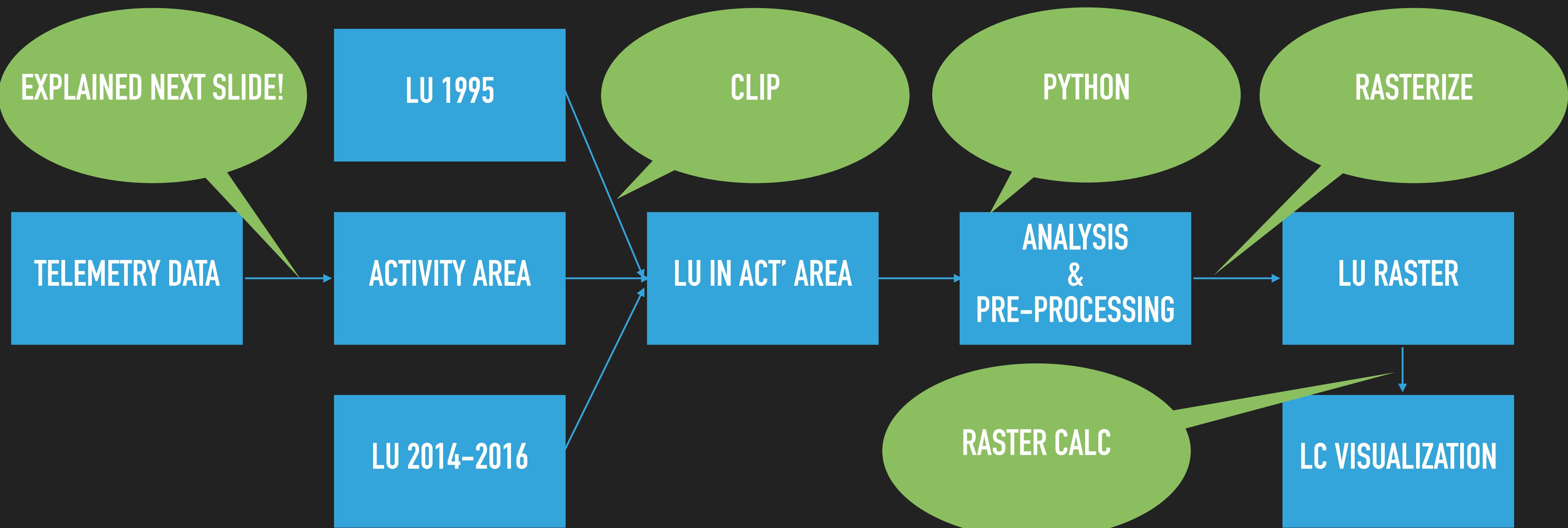
LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

FIG1: STUDY AREA (COLLIER COUNTY IN FL)



LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

WORKFLOW



ACTIVITY AREA ANALYSIS: 95% MINIMUM CONVEX POLYGONS (MCP)

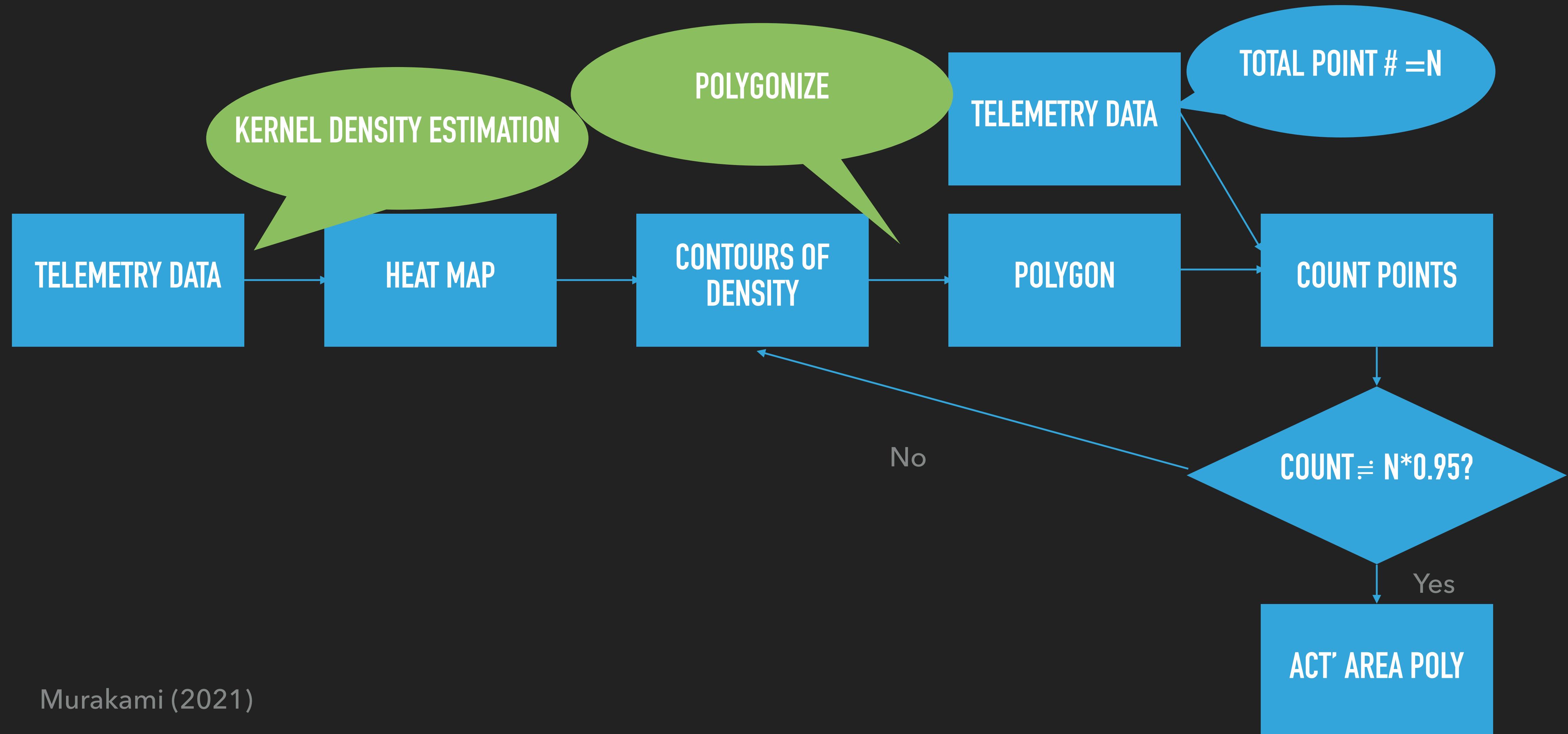
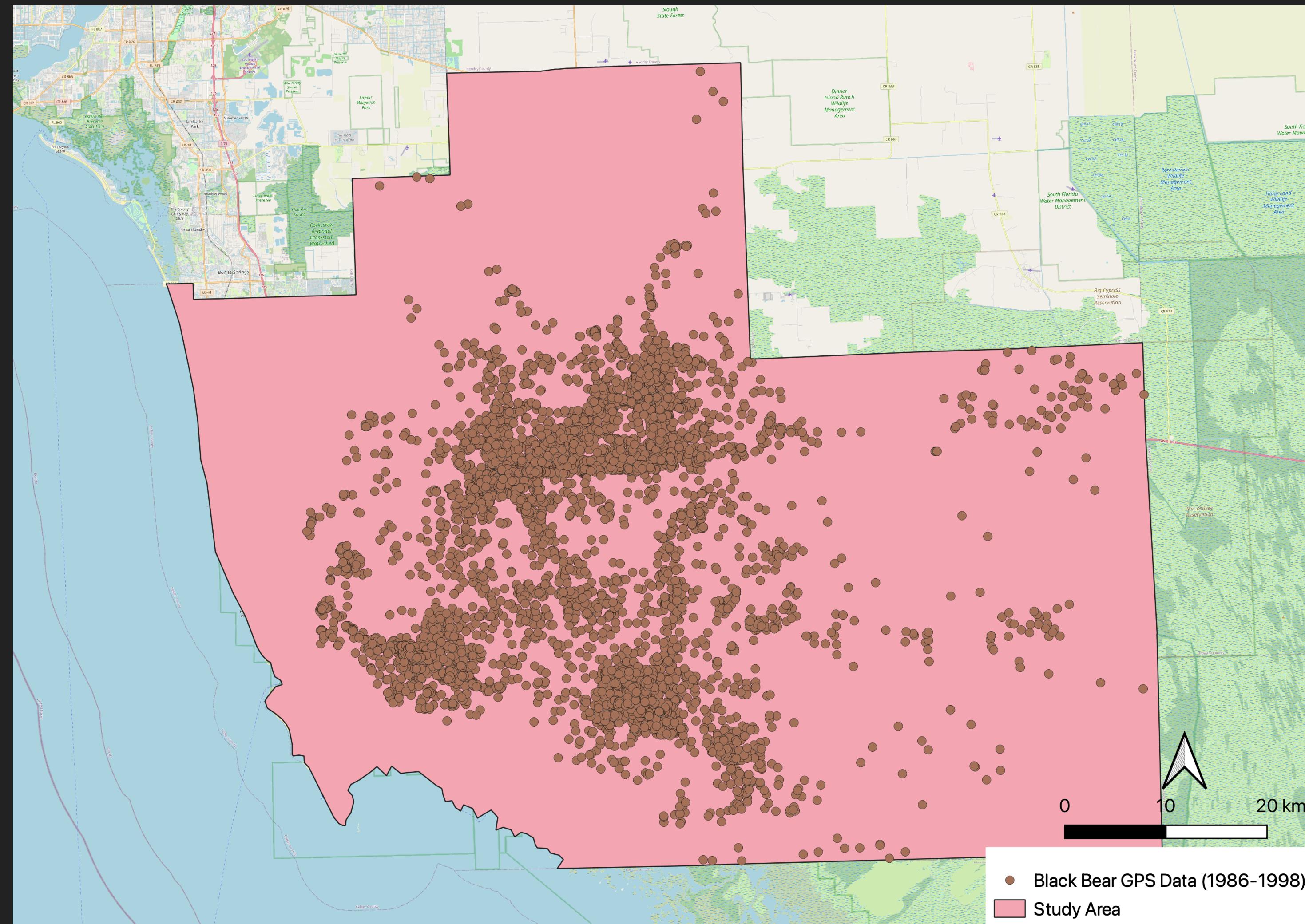


TABLE OF CONTENTS

- ▶ Introduction
- ▶ Methods
- ▶ **Results**
- ▶ Discussion&Conclusion
- ▶ Reference

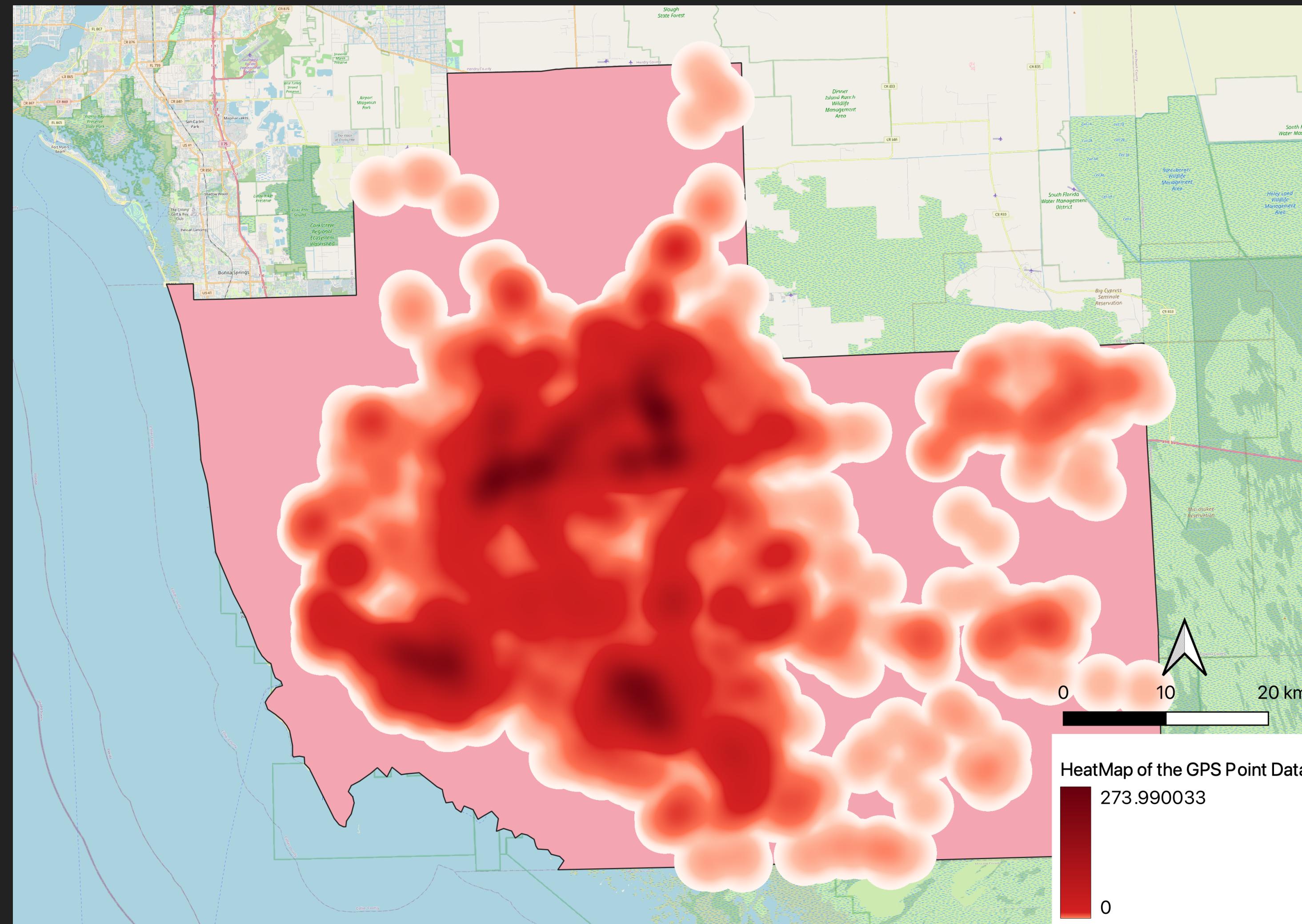
LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

FIG2: ROW TELEMETRY DATA



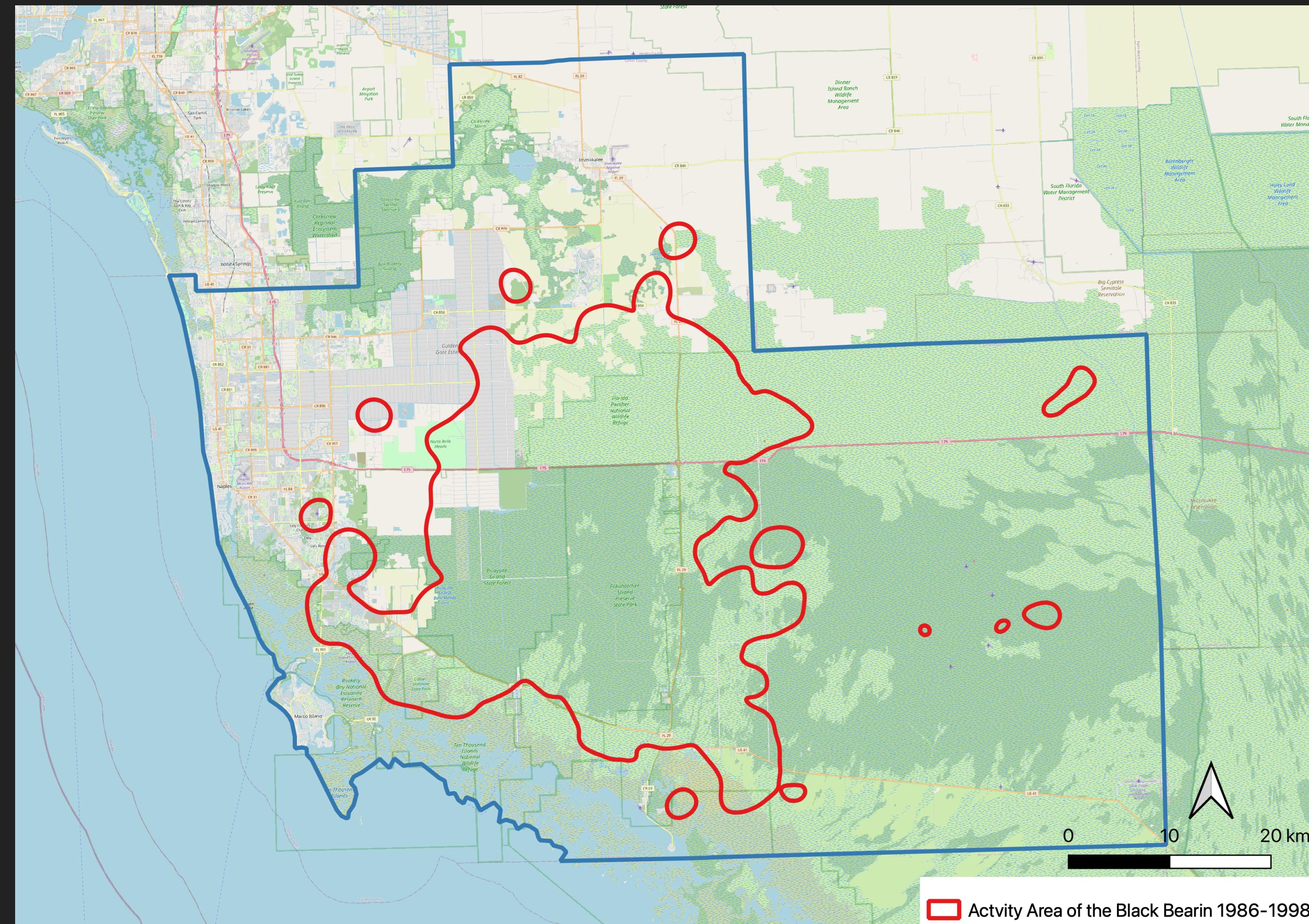
LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

FIG3: HEAT MAP OF THE POINT DISTRIBUTION



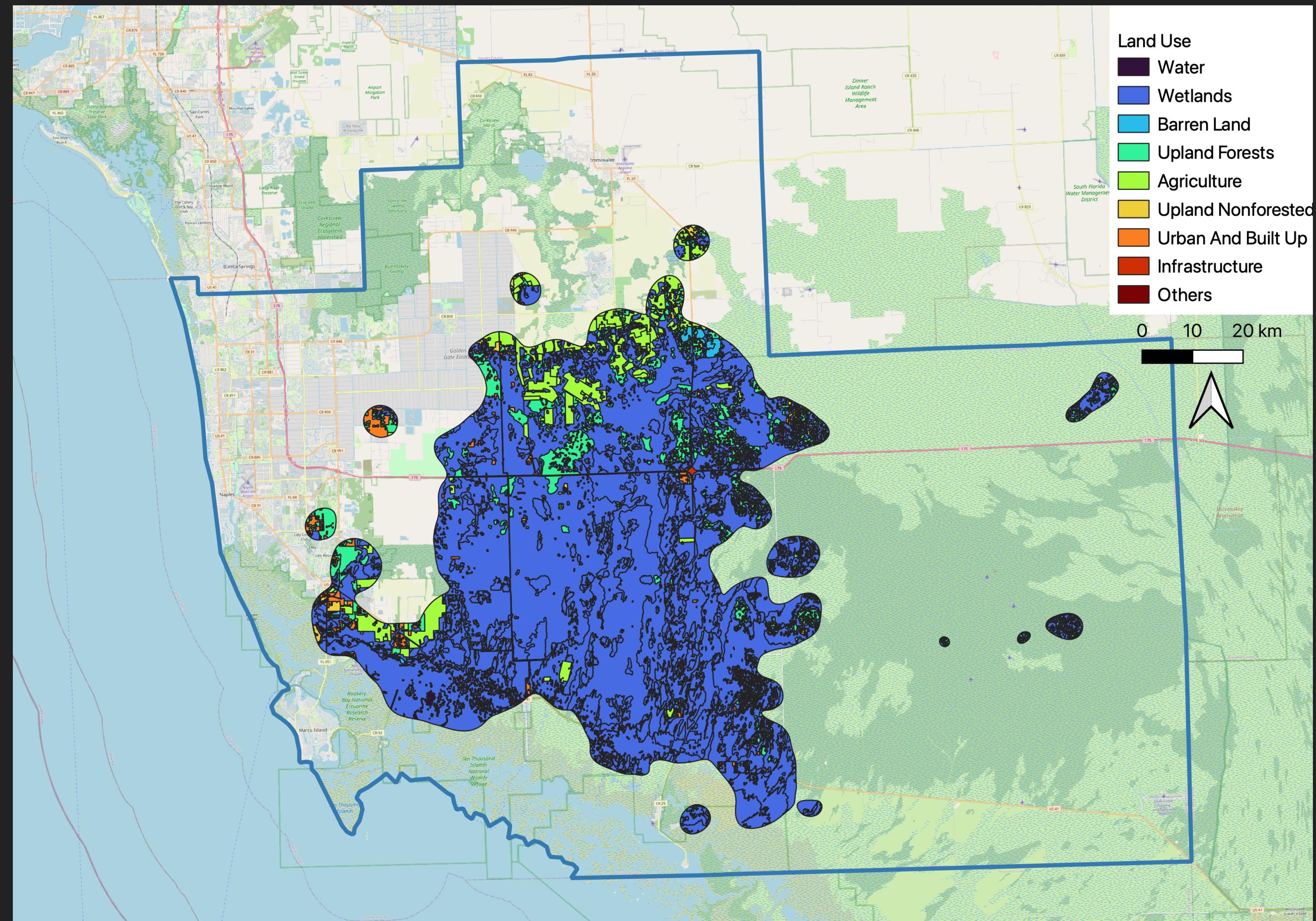
LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

FIG4: ACTIVITY AREA 1986-1997 (POINT #=6683-> 94.9% OF N ARE INCLUDED)



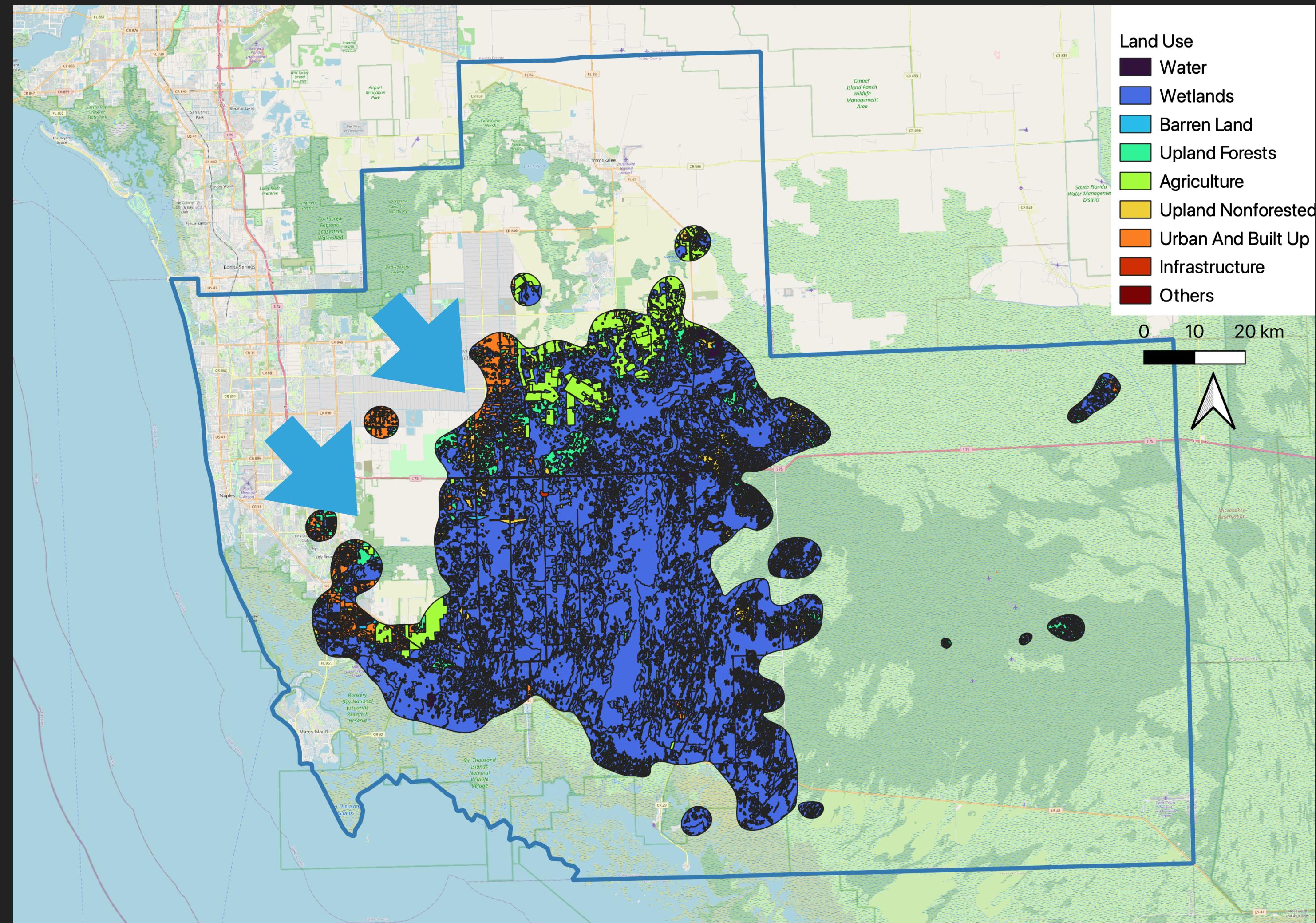
LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

FIG5: LAND USE IN 1995



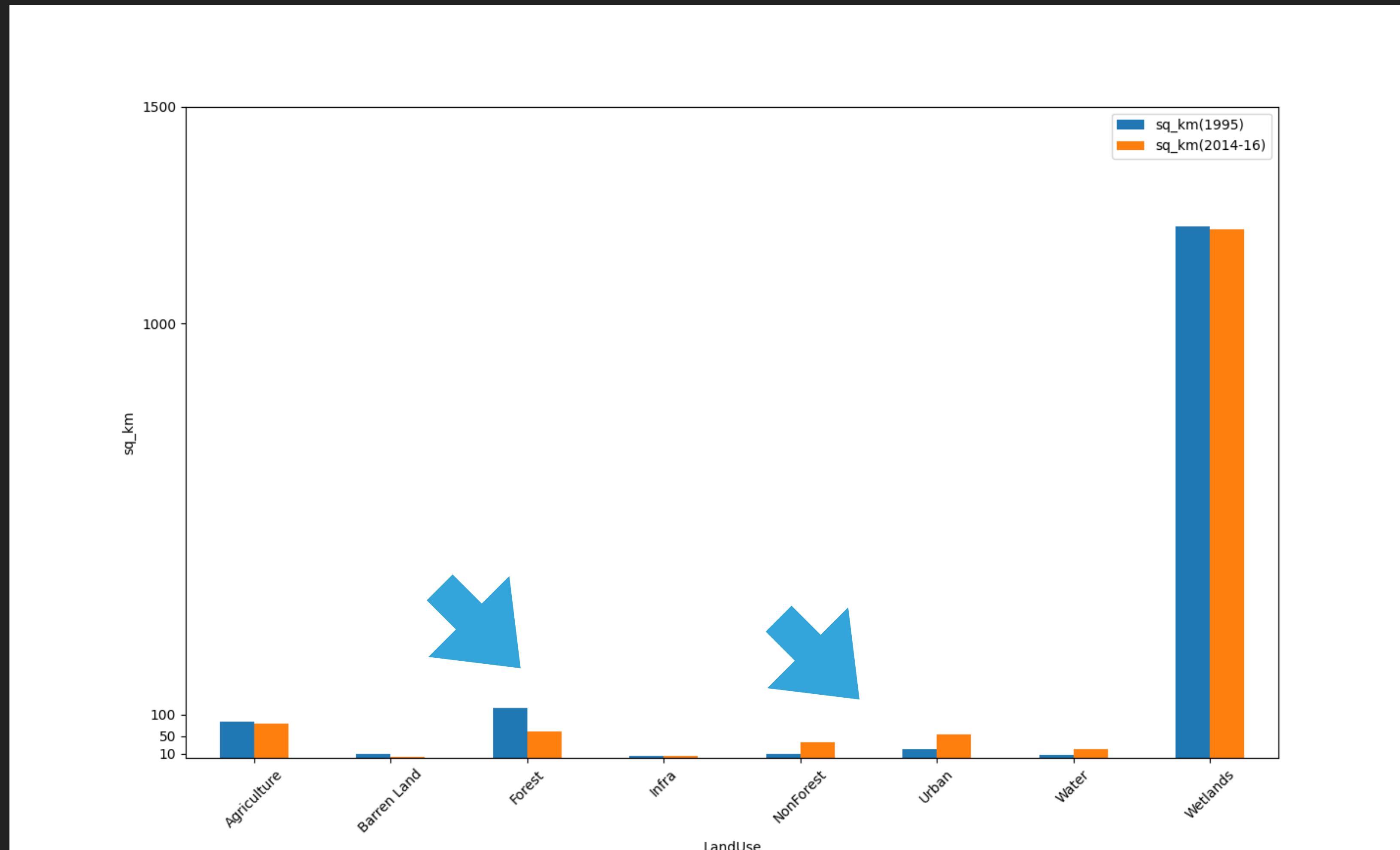
LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

FIG6: LAND USE IN 2014-16



LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

FIG7: SCALE OF LAND USE CHANGE (IN BARCHART)



LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

FIG8: SCALE OF LAND USE CHANGE (IN TABLE)

	sq_km(1995)	sq_km(2014-16)
Agriculture	83.039764	78.008935
Barren Land	8.891379	2.818986
Forest	114.604627	61.868135
Infra	4.827564	4.294474
NonForest	9.707987	35.239246
Urban	20.77195	52.94068
Water	5.61528	19.153193
Wetlands	1225.163466	1218.500994

LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

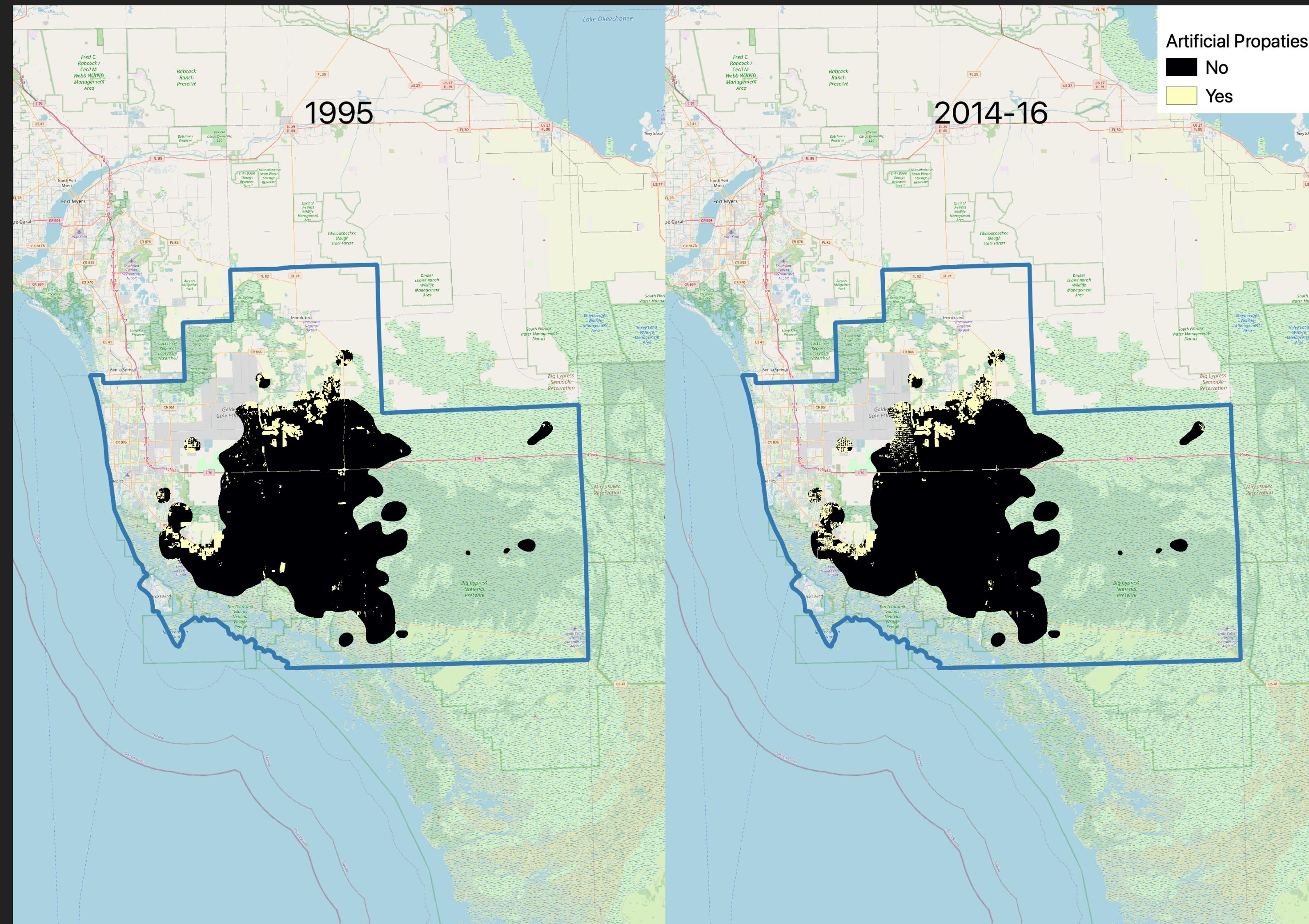
FIG9:RECLASSIFICATION FOR RASTERIZE

0 Barren Land, Upland Forest, Upland Un-forest,
(Non-artificial) Water, Wetlands

1 Agriculture, Infrastructure, Urban & Built-up
(Artificial)

LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

FIG10: ARTIFICIAL & NON ARTIFICIAL PROPERTIES



LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

FIG11:LAND CHANGE

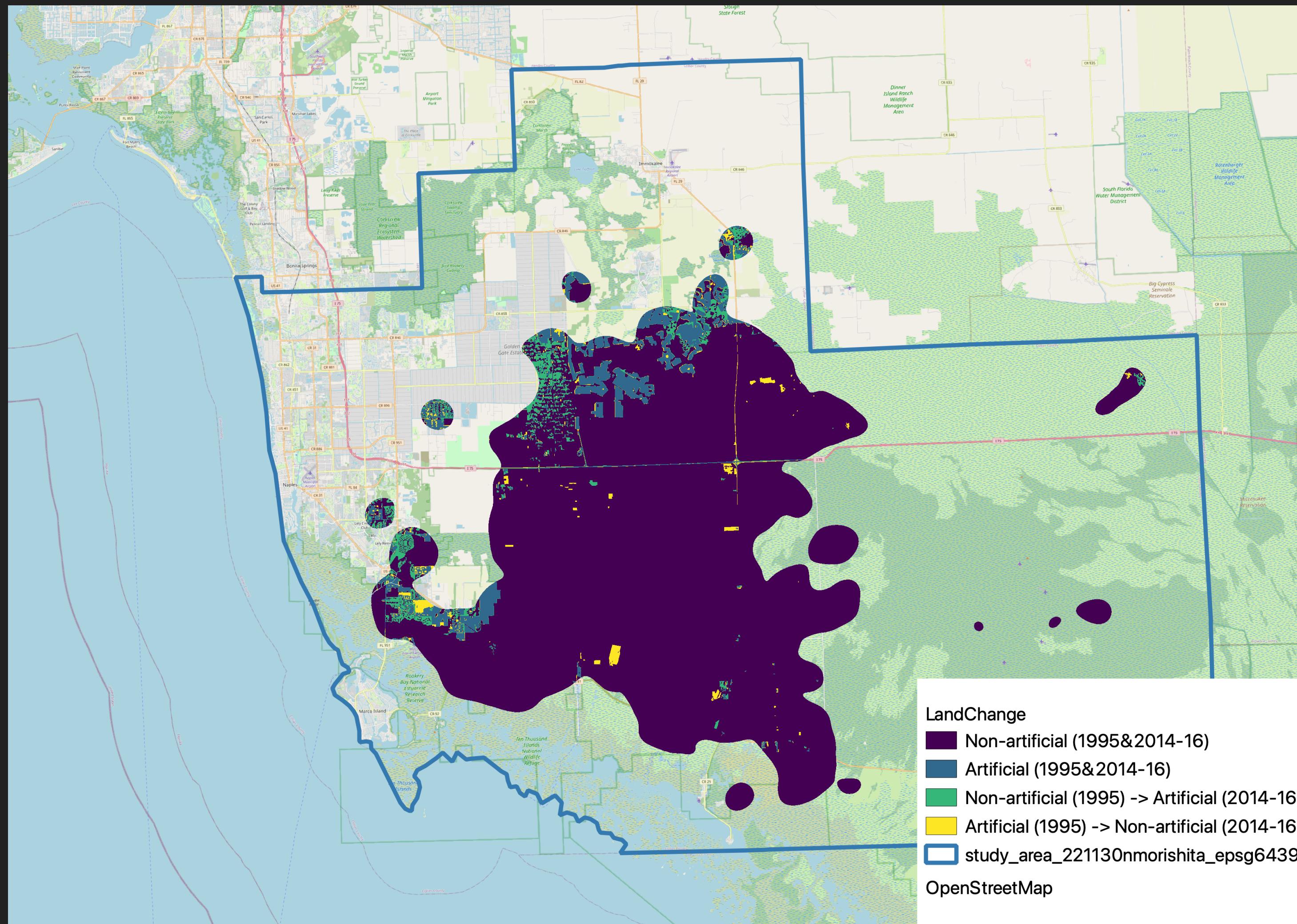


TABLE OF CONTENTS

- ▶ Introduction
- ▶ Methods
- ▶ Results
- ▶ Discussion&Conclusion
- ▶ Reference

LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

FINDINGS

- ▶ Black bears' activity areas were largely distributed to wetlands
- ▶ Non-artificial properties had been largely preserved
- ▶ However Forest in black bears' activity areas decreased & Urban increased

FURTHER RESEARCHES???

- ▶ **Activity area changed now? If yes, any relations with the LU?**
- ▶ What were (and are) in the activity areas? More fruits, for example?
- ▶ Significantly more interaction (call, car accident etc) in the land changed areas?
- ▶ Home range analysis methods: MCP vs Kernel. The activity areas change?
 - ▶ Can be done with R (Calenge, 2006).
- ▶ Really changed? Especially urban-> nature areas for real?
- ▶ Remote Sensing?: Supervised Classification? Change Detection?

TABLE OF CONTENTS

- ▶ Introduction
- ▶ Methods
- ▶ Results
- ▶ Discussion&Conclusion
- ▶ Reference

LAND CHANGES IN FORMER ACTIVITY AREA OF BLACK BEARS IN SOUTHERN FLORIDA

REFERENCE

Burt, W. H. (1943). Territoriality and home range concepts as applied to mammals. *Journal of mammalogy*, 24(3), 346-352.ISO 690

Calenge, C. (2006). The package “adehabitat” for the R software: a tool for the analysis of space and habitat use by animals. *Ecological modelling*, 197(3-4), 516-519.

Murakami, H. (2021, 1 15). How to Estimate Activity Areas? (N. Morishita, Interviewer)

Simcharoen, A. C. H. A. R. A., Savini, T., Gale, G. A., Simcharoen, S., Duangchantrasiri, S., Pakpien, S., & Smith, J. L. (2014). Female tiger *Panthera tigris* home range size and prey abundance: important metrics for management. *Oryx*, 48(3), 370-377.