

# Assessing the Habitat Characteristics of a High Density Eastern Box Turtle (*Terrapene carolina*) Population

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## Introduction

- Eastern Box Turtle (*Terrapene carolina*) is a terrestrial turtle species of greatest conservation need in the Northeastern U.S. and a protected species in New Jersey
- Eastern Box Turtles are ectotherms, meaning they rely on outside sources to regulate their body temperature, so accessibility to different land cover types is crucial to regulating their body temperature
- Recently, a robust population of eastern box turtles, of over 130 individuals, was found at a local park (the name of the park is excluded to reduce turtle poaching)
- To better understand why there are so many turtles within the park the habitat characteristics of the park were examined using land cover data and ArcGIS software

## Methods

- Turtles were found via a scent tracking dog and incidentally while in the field
- Upon capture, turtle locations were marked using a GPS device
- Turtle GPS locations and land cover data were uploaded to ArcGIS and spatial join was used to count the turtle points
- Kernel density estimates were created to visualize the density of turtles were found in the park



# From a Landscape Level, Eastern Box Turtles Use a Variety of Land Cover Types in a Highly Suburban Monmouth County Park

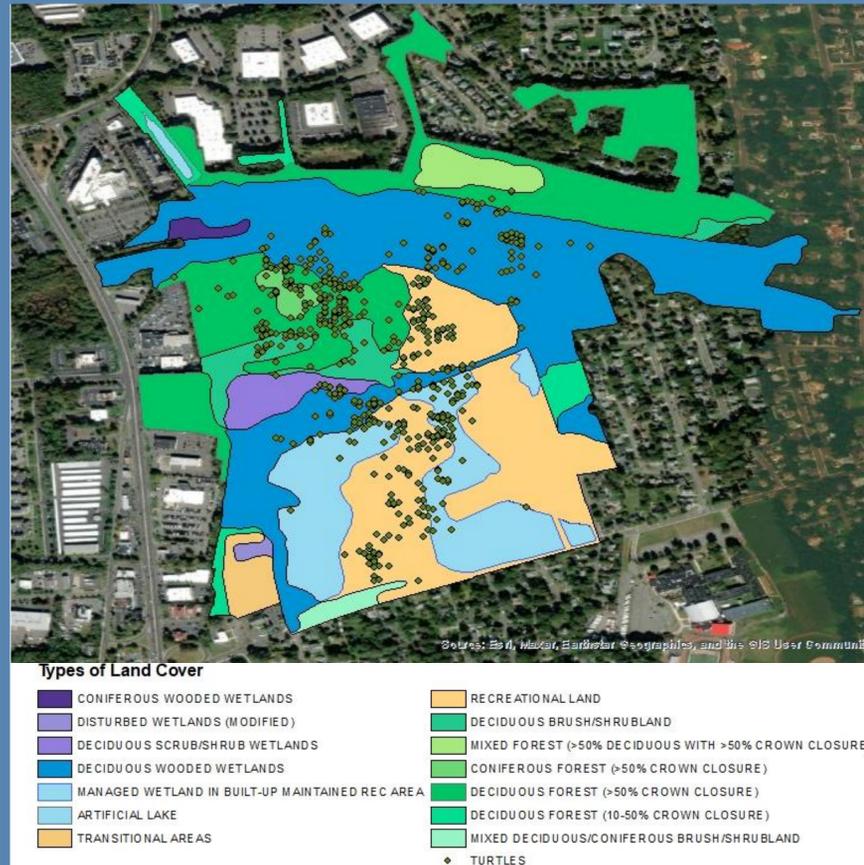


Figure 1. A Monmouth County Park separated into sections based on land cover data types. The GPS points of turtles that were incidentally found or located using radio telemetry are plotted on the map.

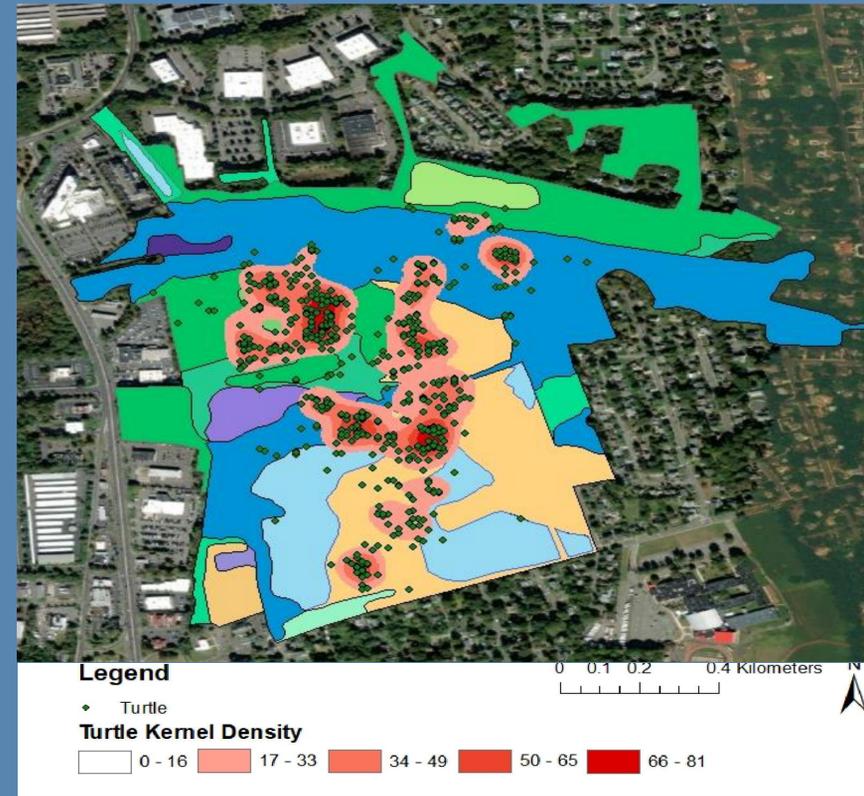


Figure 2. A Monmouth County Park separated into sections based on land cover data types. The GPS points of turtles that were incidentally found or located using radio telemetry are plotted on the map. A Kernel Density estimate of the turtles is overlaid, with each respective color giving an estimate of the density of turtles within a given hectare.

Table 1: Land type describes the different land cover types found in the park, hectare describes the size of each land cover type, category describes the broader category, % of park refers to the percentage of the park that the land cover type occupies, turtle count refers to the number of turtles found within each land cover type, and turtles/hectare refers to the number of turtles found per hectare.

| Land Type   | Hectares | Category | % of Park | Turtle Count | Turtles/Hectare |
|---|----------|----------|-----------|--------------|-----------------|
| CONIFEROUS WOODED WETLANDS                            | 0.51     | WETLANDS | 0.57      | 0            | 0               |
| DISTURBED WETLANDS (MODIFIED)                         | 0.26     | WETLANDS | 0.29      | 0            | 0               |
| DECIDUOUS SCRUB/SHRUB WETLANDS                        | 1.86     | WETLANDS | 2.08      | 13           | 7               |
| MANAGED WETLAND IN BUILT-UP MAINTAINED REC AREA       | 10.36    | WETLANDS | 11.57     | 81           | 8               |
| DECIDUOUS WOODED WETLANDS                             | 29.2     | WETLANDS | 32.62     | 287          | 10              |
| ARTIFICIAL LAKES                                      | 0.3      | WETLANDS | 0.34      | 0            | 0               |
| MIXED DECIDUOUS/CONIFEROUS BRUSH/SHRUBLAND            | 0.76     | FOREST   | 0.85      | 0            | 0               |
| DECIDUOUS FOREST (10-50% CROWN CLOSURE)               | 2.34     | FOREST   | 2.61      | 0            | 0               |
| DECIDUOUS BRUSH/SHRUBLAND                             | 2.99     | FOREST   | 3.34      | 26           | 9               |
| DECIDUOUS FOREST (>50% CROWN CLOSURE)                 | 20.28    | FOREST   | 22.66     | 120          | 6               |
| MIXED FOREST (>50% DECIDUOUS WITH >50% CROWN CLOSURE) | 1.69     | FOREST   | 1.89      | 0            | 0               |
| CONIFEROUS FOREST (>50% CROWN CLOSURE)                | 0.7      | FOREST   | 0.78      | 16           | 23              |
| RECREATIONAL LAND                                     | 16.87    | URBAN    | 18.85     | 106          | 6               |
| TRANSITIONAL AREAS                                    | 1.39     | URBAN    | 1.55      | 0            | 0               |

## Results

1. There were 3 primary land types:
  - 47.1% of the park is wetlands
  - 32.1% of the park is forest
  - 20.8% of the park is urban land
2. The 3 categories were further subdivided into 14 subcategories with:
  - 6 different types of wetlands
  - 6 different types of forest
  - 2 different types of urban/barrenlands
3. Turtles were found to use 7 different types of land cover with:
  - 13 in deciduous shrub/shrub wetlands
  - 81 in managed wetlands in built-up maintained rec areas
  - 287 in deciduous wooded wetlands
  - 26 in deciduous brush/shrublands
  - 120 in deciduous forest with (>50% crown closure)
  - 16 in coniferous forest(>50% crown closure)
  - 106 in recreational land



## Conclusions

- Turtles were found to use a variety of different land cover types including wetlands, forests, and urban lands
- Turtles did not use all habitats within the park, but this is likely a result of sampling bias because it would not make sense for us to incidentally find turtles in areas we were not searching in
- To definitively say if there are no turtles in the seven unoccupied land cover types, systematic searches of uninhabited areas need to occur