



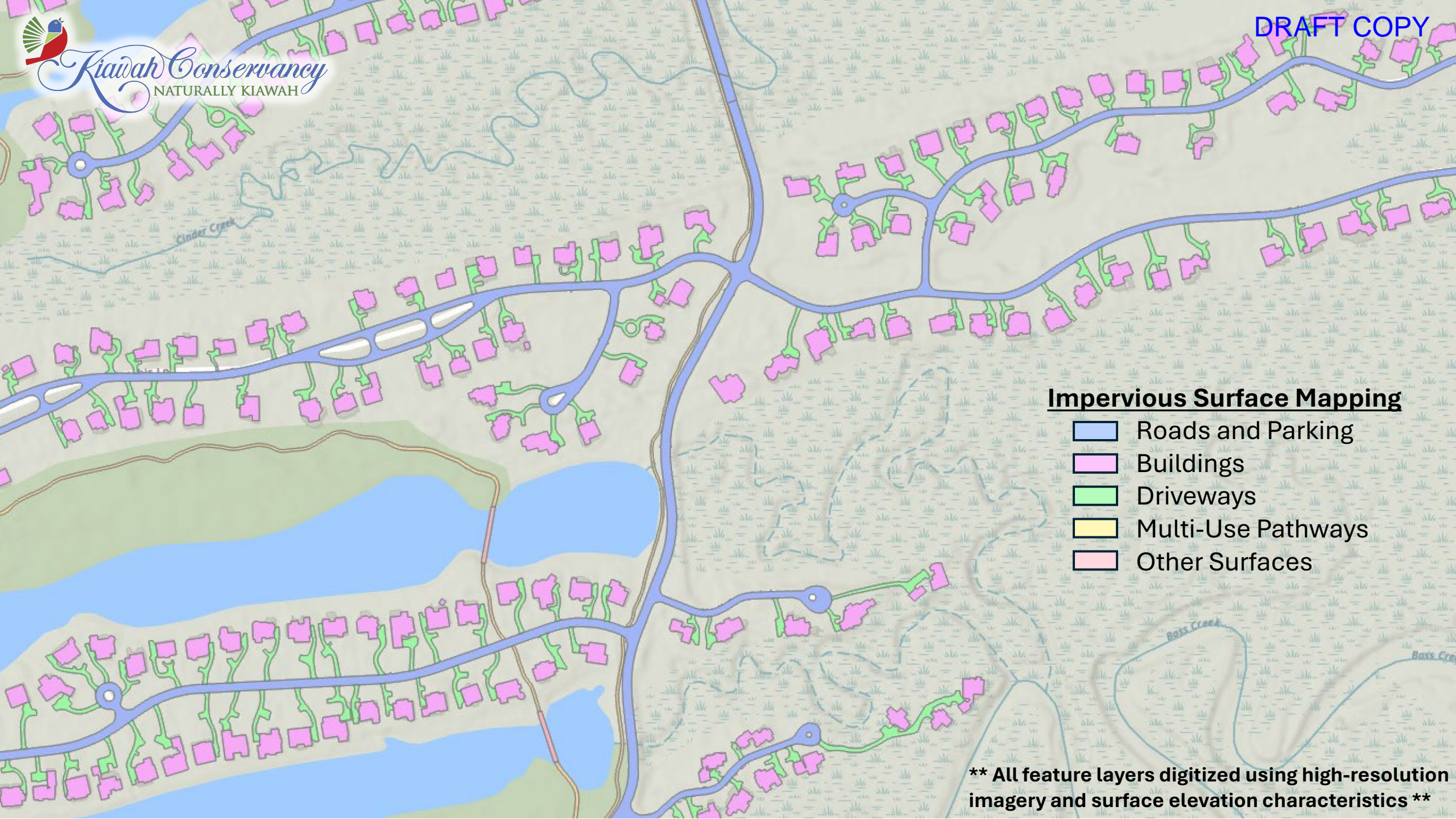
Impervious Surface Data & Analysis

M. Lee Bundrick, MS, MPA






Sr. Ecological Health & Conservation Coordinator

Town of Kiawah Island Planning Commission
September 30, 2024

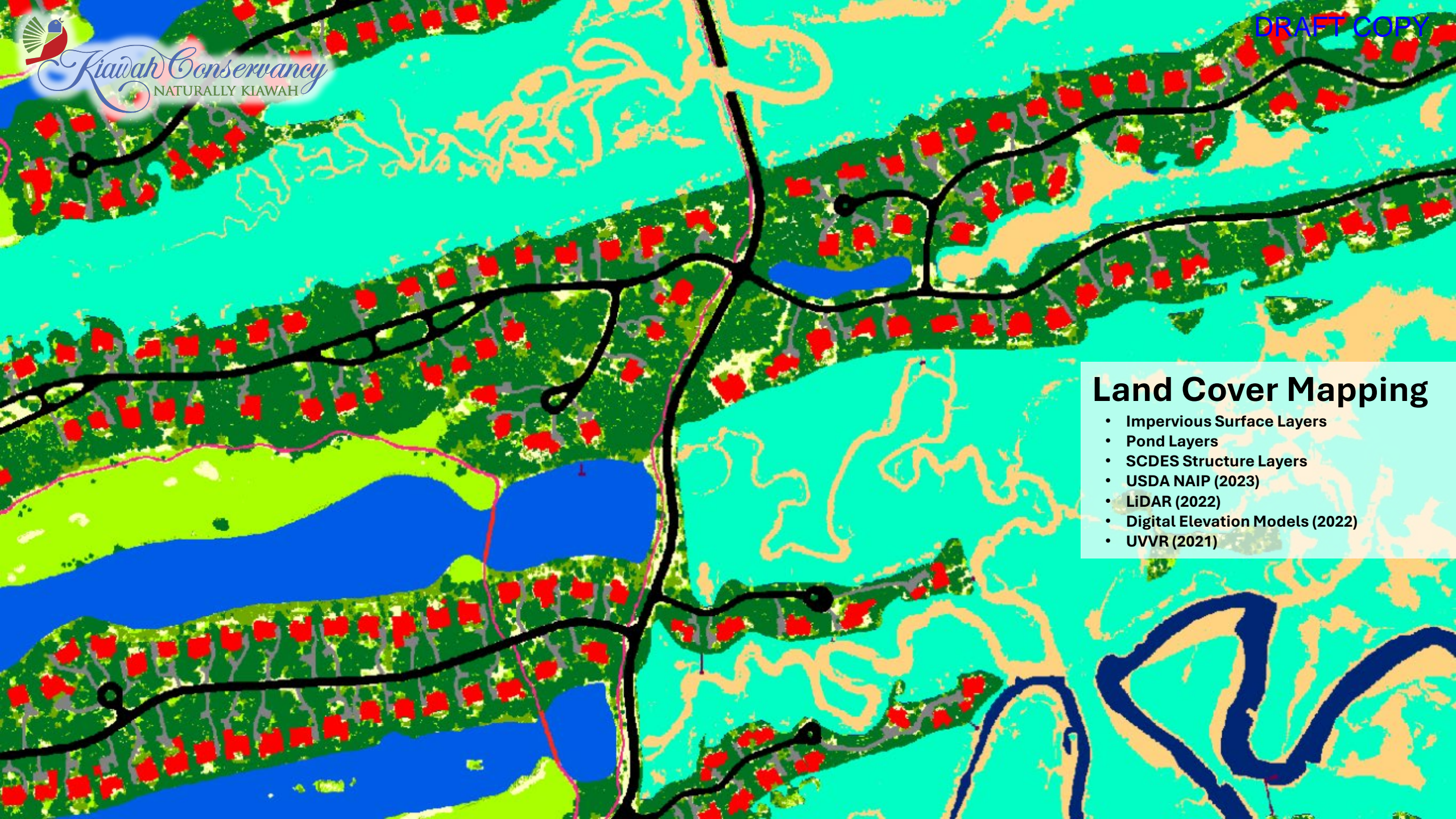




Impervious Surface Mapping

-  Roads and Parking
-  Buildings
-  Driveways
-  Multi-Use Pathways
-  Other Surfaces

**** All feature layers digitized using high-resolution imagery and surface elevation characteristics ****



Land Cover Mapping

- Impervious Surface Layers
- Pond Layers
- SCDES Structure Layers
- USDA NAIP (2023)
- LiDAR (2022)
- Digital Elevation Models (2022)
- UVVR (2021)

Existing Impervious Surface Summary

Kiawah Island

3725

Total upland acres

669

Acres of impervious cover

18%

Impervious cover

Surface Type	Number	Acreage (% upland total)
Buildings	3545	262.32 (39.2%)
Driveways	2696	112.13 (16.8%)
Roads & Parking	-	241.94 (36.2%)
Multi-use Pathways	-	43.08 (6.4%)
Other	58	9.77 (1.4%)
Total Impervious		669.24

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Ecosystem Impact Thresholds



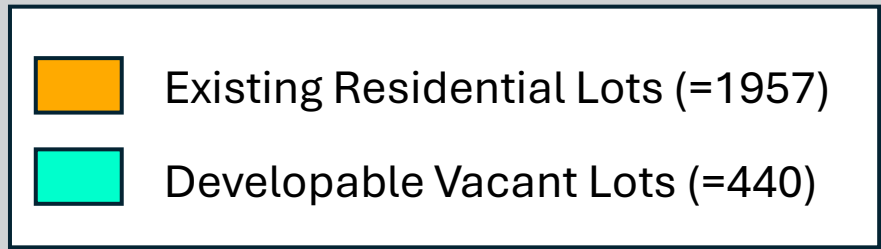
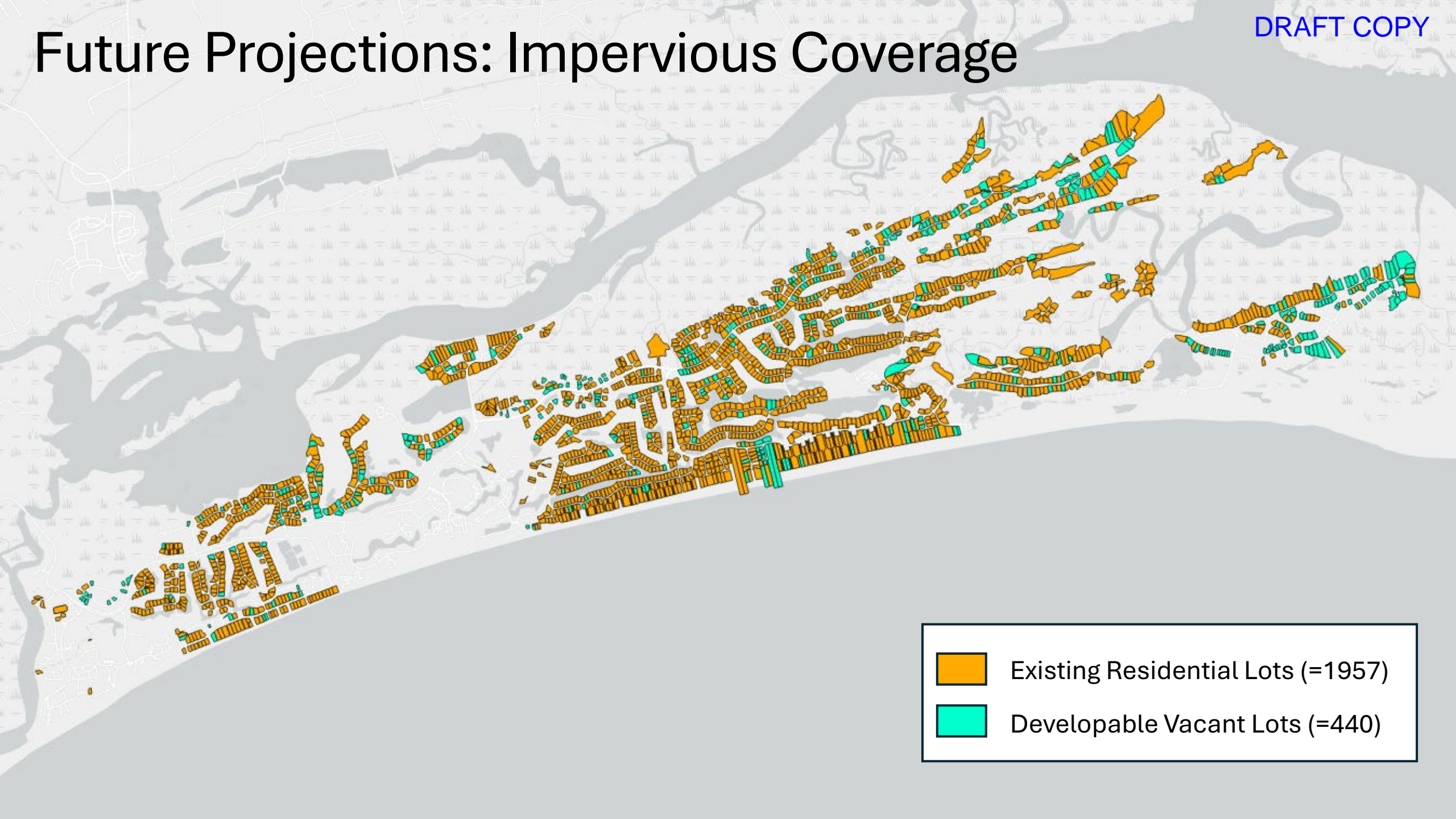
SCDNR / NOAA *(Holland et al., 2005; Sanger et al., 2015; Parker et al., 2023)*

- Adverse physical and chemical changes exceeding **10-20%** impervious cover
- Significant changes exceeding **20-30%** impervious cover
- Measurable increases in PAHs, trace metals, PBDEs.

USEPA Specific Impact Thresholds

- High algal biomass (> 5%)
- Benthic invertebrates (8-15%)
- Macroinvertebrate diversity & richness (8-12%)
- Fish biological integrity (6-11%)
- Geomorphic response patterns (13-24%)
- Channel instability (> 10%)

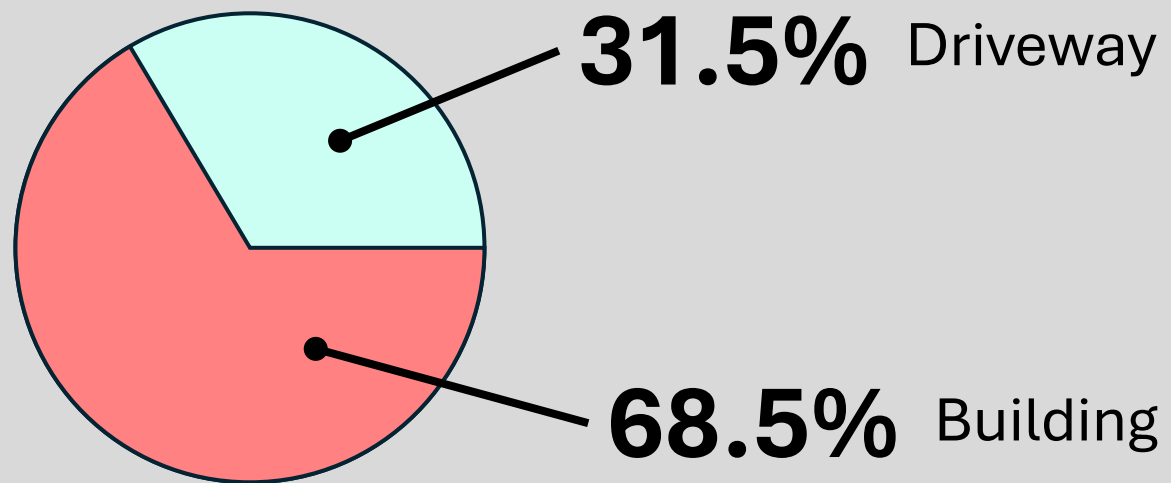
Future Projections: Impervious Coverage



Existing Residential Lot Coverage



Impervious Composition (Median)



Median lot coverage: 25.8%

440 Developable Parcels*

*Removed parcels owned by the Kiawah Conservancy and KICA
Outliers removed based on lot size & characteristics*

Scenario A

Maximum lot coverage (TOKI Code §12-65)

*Lot size 8,000 –11,999 SF --- 40%
Lot size 12,000+ SF --- 33%*

Scenario B

Median lot coverage (analysis)

All lots 25.8 %

Scenario A: Maximum Build-Out

Cover	Increase	Total Coverage	Impervious (%age)	Upland Cover
Driveways	+21.5 ac	133.6 ac	18.1%	3.6%
Buildings	+46.9 ac	309.2 ac	41.9%	8.3%
Total Impervious	+68.4 ac	737.6 ac		19.8%

3.6%

Driveways (+0.6%)

19.8%

Total Impervious (+1.8%)

Upland Coverage

Scenario B: Median Build-Out

Cover	Increase	Total Coverage	Impervious (%age)	Upland Cover
Driveways	+15.5 ac	127.6 ac	17.8%	3.4%
Buildings	+33.7 ac	296.0 ac	41.2%	7.9%
Total Impervious	+49.2 ac	718.4 ac		19.3%

3.4%

Driveway cover (+0.4%)

19.3%

Total Impervious (+1.3%)

Upland Coverage

Impervious Coverage at Build-Out

18%

Existing Impervious Cover



3.0% driveways
(112.1 acres)

19.3%

Future Impervious Cover
Increase w/ Median Coverage



3.4% driveways
(127.6 acres)

19.8%

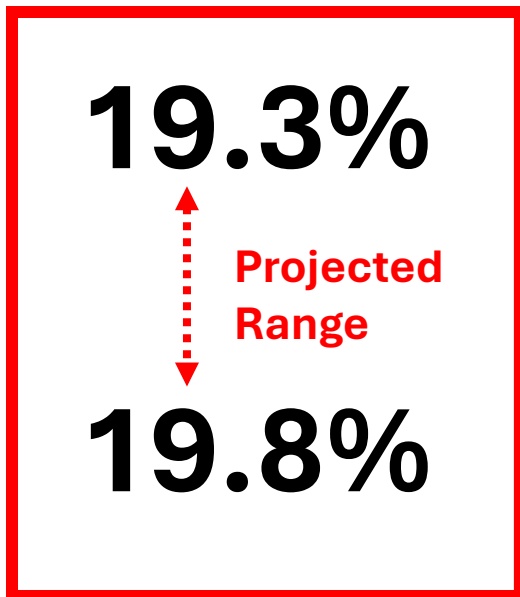
Future Impervious Cover
Increase w/ Maximum Coverage



3.6% driveways
(133.6 acres)

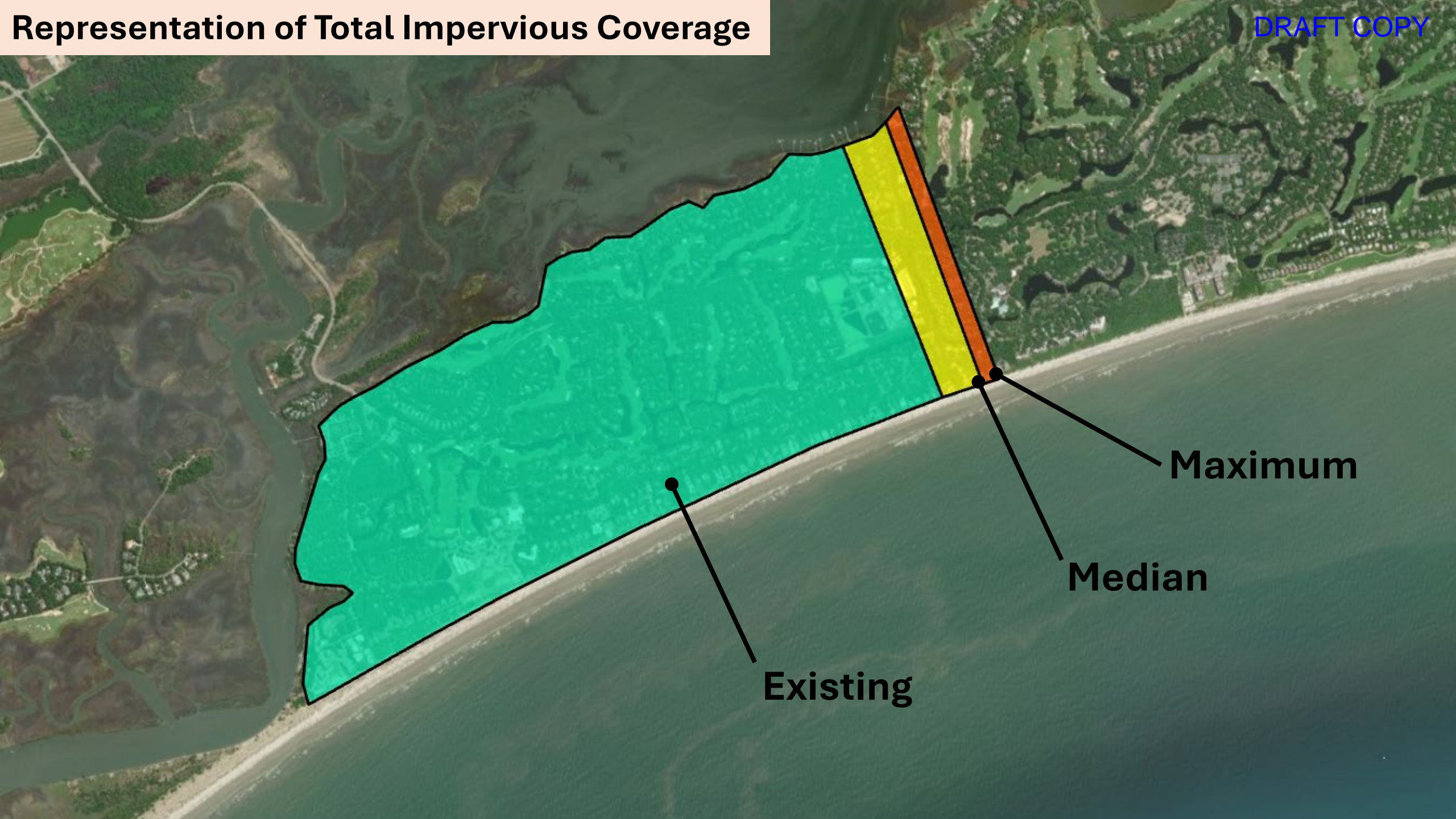


**Projected
Range**



Representation of Total Impervious Coverage

DRAFT COPY



Existing

Median

Maximum

Summary

Kiawah Island is currently **18%** impervious cover

Next threshold for increased ecological impacts is **20%**

- +70 acres to reach threshold

Residential build out approximately **19.5%** impervious cover

- 1.5% projected increase (55.9 ac)
- Total projected driveway coverage is 3.5%
- *Does not include future commercial development*