



SOUTH ATLANTIC
LANDSCAPE CONSERVATION COOPERATIVE

State of the South Atlantic 2015
Development Process

Introduction

The *State of the South Atlantic* is a South Atlantic LCC publication designed to help us all understand our living landscapes—from hardwood forests and aquatic diversity in the Piedmont ecoregion to ships unloading freight near historic lighthouses along the shoreline. In addition to highlighting the area’s conservation successes and challenges, the State of the South Atlantic provides a report card for the current condition of our important resources. You can read about all the South Atlantic ecosystems, learn how they currently score in terms of ecological health, and see forecasts for the future. The scores are based on the measurement of key natural and cultural resource indicators, all detailed in the *State of the South Atlantic*. With a combination of colorful illustrations, graphics, photos and meaningful measurements, *the State of the South Atlantic* paints a comprehensive picture of where we live and where we stand.

This assessment evaluates the ecological integrity of the South Atlantic using natural and cultural resource indicators. The indicators are scored across the entire region, for each ecosystem, and within subregions following watershed and ecoregional boundaries. With extensive input from the broader cooperative community, the South Atlantic LCC regularly revises and tests all indicators, and this first report uses the best metrics available as of March 2015.

Development

The *State of the South Atlantic 2015* measures and scores the South Atlantic LCC ecosystem indicators used in Version 2.0 of the Conservation Blueprint. The indicator layers and metadata are available [in the Blueprint 2.0 Data Gallery on the Conservation Planning Atlas](#). Any changes made to those indicator layers before analysis in the State of the South Atlantic is reported in the Indicators section below.

Each data-driven indicator score is based on the percent of an area in good condition, according to the best available science (Table 1). Scores are computed for the South Atlantic region overall, for seven subregions based on watershed and Omnerik ecoregional boundaries (North Piedmont, South Piedmont, North Coastal Plain, Central Coastal Plain, South Coastal Plain, Gulf Coastal Plain), for each ecosystem, and for individual indicators (Table 2). An area with 80-100% of its pixels in good condition received an A; 79-60% in good condition received a B; 59-40% in good condition received a C; 39-20% in good condition received a D; and 19-0% in good condition received an F. The “good condition” thresholds were based whenever possible on the peer-reviewed literature (see Blueprint 2.0 indicator metadata). In the absence of peer-reviewed science, the thresholds are based on expert judgment.

Indicators were not scored if no biological thresholds could be determined because of insufficient historical data to define “good”. For example, some extent indicators (e.g., acres of maritime forest) lack the necessary historic data to put the current value into context. Though the indicator tells us how many acres of maritime forest exist today, we don’t have enough information on past extent to convert the decline in extent to a specific letter grade. Relative indicators that identify where the top percentage of the metric occurs, but do not provide an absolute measurement, were also not included in the score calculations. For example, the beach bird index identifies the highest concentration of beach birds—even if all the numbers are skewed much lower than they should be by human activity. These indicators are

marked “not scored; baseline for future” and may be used in later *State of the South Atlantic* assessments as a baseline for comparing trends.

Confidence values are qualitative estimates of uncertainty based on known issues with indicators and data sources.

Good condition thresholds

Table 1. “Good condition” thresholds for indicator scoring in the *State of the South Atlantic 2015*.

	Indicator values	Score calculation
Landscapes		
Low road density	Road length per unit area (km/sq km): 0 = road density > 1.5 1 = road density < 1.5	% rated as 1
Low-urban historic places	0 = National Register of Historic Places area > 50% urban 1 = National Register of Historic Places area < 50% urban	% rated as 1/area of all historic places
Structural connectivity	Hubs Corridors Auxiliary Connections Background	% in hub or corridor
Resilient biodiversity hotspots	0 = < 1 SD below average terrestrial resilience 1 = + 1 SD above average terrestrial resilience	Not scored; baseline for future Relative indicator
Beach and Dune		
Beach birds	0-9 ranking of relative bird abundance (Wilson's plover, American oystercatcher, least tern, piping plover)	Not scored; baseline for future Relative indicator
Beach alteration*	0 = vulnerable to alteration, with/without nearby jetties/groins 1 = less vulnerable with nearby jetties/groins 2 = less vulnerable without nearby jetties/groins	% rated as 2

Maritime Forest		
Maritime forest extent	1 = maritime forest	Not scored; baseline for future Lacking historical context
Estuarine		
Wetland patch size	Wetland patch size (hectares), in quantiles: 0 = 1-328 1 = 329-1,228 2 = 1,229-3,087 3 = 3,088-6,088 4 = 6,088-15,154	Not scored; baseline for future Lacking historical context
Water-vegetation edge	Length of marsh-water interface per unit area (km/sq km), in quantiles: 0 = 0-0.61 1 = 0.61-1.68 2 = 1.68-2.82 3 = 2.82-4.27 4 = 4.27-19.42	Not scored; baseline for future Lacking historical context
Coastal condition	Average of sampled points from EPA Coastal Condition Index (Benthic index, Water quality, Sediment quality). Converted to 5 point scale to match EPA scoring rubric.	EPA's scoring system for letter grades
Forested wetland		
Forested wetland extent	1 = forested wetland	Not scored; baseline for future Lacking historical context
Forested wetland birds	0 = less potential for presence of forested wetland bird index species 1 = potential for presence of Northern parula, black-throated green warbler, red-headed woodpecker, or Chuck-will's widow 2 = potential for additional presence of prothonotary warbler 3 = Potential for additional presence of Swainson's warbler	% rated as 1, 2, or 3

Forested wetland amphibians	0 = not a Priority Amphibian and Reptile Conservation Area (PARCA) within forested wetlands 1 = Priority Amphibian and Reptile Conservation Area (PARCA) within forested wetlands	Not scored; baseline for future Relative indicator
Freshwater Aquatic		
Riparian buffers	Percent of natural habitat near natural rivers, streams, and waterbodies: 0 = ≤ 80%; 1 = 80-85% 2 = 85-90% 3 = 90-95% 4 = 95-100%	% rated as 4
Impervious surface[^]	Percent impervious cover by catchment: 0 = > 10% impervious cover 1 = ≤ 10% and > 5% impervious cover 2 = ≤ 5% impervious cover	% rated as 2
Marine		
Marine turtles and mammals	0 = not high density for any species group during any time of the year 1 = high density for 1 species group during any time of the year 2 = high density for multiple species groups	Not scored; baseline for future Lacking historical context
Potential hardbottom condition	1 = hardbottom likely stressed by human activities 2 = hardbottom less likely stressed by human activities 3 = hardbottom likely in best condition due to additional protections	% rated as 2 or 3/area of hardbottom
Primary productivity	Max minus mean productivity (mg carbon/sq m/day), manually classified into 3 categories: -1 = eutrophication or abnormally high primary productivity, likely due to excessive nutrient inputs 0 = lower primary productivity 1 = medium/high primary productivity, likely due to natural processes	% rated as 0 or 1

Pine & Prairie		
Longleaf pine extent	Longleaf pine acreage by USFS Forest Inventory and Analysis Unit	Not scored; baseline for future Lacking historical context
Pine & prairie birds	Increasingly restrictive habitat suitability for three pine & prairie bird species: 0 = pine index birds absent 1 = 1 pine index bird present 2 = 2 pine index birds present 3 = 3 pine index birds present (Bachman's sparrow, bobwhite quail, and red-cockaded woodpecker)	% rated 1, 2, or 3
Pine & prairie amphibians	0 = not a Priority Amphibian and Reptile Conservation Area (PARCA) within pine & prairie 1 = Priority Amphibian and Reptile Conservation Area (PARCA) within pine & prairie	Not scored; baseline for future Relative indicator
Regularly burned habitat	0 = not recently burned or not open canopy 1 = recently burned open canopy	% rated as 1
Freshwater Marsh		
Freshwater marsh extent	0 = not freshwater marsh 1 = freshwater marsh	Not scored; baseline for future Lacking historical context
Freshwater marsh birds	Patch size based on suitability for > 10 marsh bird species (hectares): 0 = less potential for freshwater marsh bird presence (< 5 ha) 1 = potential presence of least bittern, redhead, Northern pintail, Northern shoveler, and others (≥ 5 and ≤ 20 ha) 2 = potential presence of king rail (> 20 ha)	% rated 1 or 2

Waterscapes		
Fresh & saltwater connectivity	# of downstream dams: 0 = >3 1 = 3 2 = 2 3 = 1 4 = 0	% rated as 4
Resident fish connectivity	Weighted index of upstream and downstream dam and stream crossing densities: 0 = >5 (poorest quality) 1 = 1-5 2 = 0.1-1 3 = < 0.1 4 = no dams or stream crossings	% rated as 4
Upland Hardwood		
Upland hardwood birds	Increasingly restrictive habitat suitability for seven upland hardwood bird species: 0 = less potential for presence of upland hardwood bird index species 1 = potential for presence of wood thrush or whip-poor-will 2 = potential for additional presence of hooded warbler or American woodcock 3 = potential for additional presence of Acadian flycatcher or Kentucky warbler 4 = potential for additional presence of Swainson's warbler	% rated as 3 or 4
Urban open space	Distance of open space from urban areas: 1 = any non-urban area 1600 m from urban 2 = protected area 1600 m from urban 3 = any non-urban area 800 m from urban 4 = protected area 800 m from urban 5 = any non-urban area 400 m from urban 6 = protected area 400 m from urban	Not scored; baseline for future Lacking historical context

*Renamed "Unaltered beach" to better reflect the way the indicator is calculated, where high values indicate better ecological condition.

^Renamed "Permeable surface" to better reflect the way the indicator is calculated, where high values indicate better ecological condition.

Indicators

Beach & Dune

Index of beach birds

Not scored, marked baseline for future.

Unaltered beach

Used as-is under the name "beach alteration". Score = % rated as 2.

Estuarine

Water-vegetation edge

Not scored, marked baseline for future.

Wetland patch size

Not scored, marked baseline for future.

Coastal condition

The Coastal Condition Index was computed using an average of sampled points rather than interpolation. Score calculated using EPA's scoring system for letter grades.

Forested Wetland

Forested wetland amphibians

Not scored, marked baseline for future.

Forested wetland extent

Not scored, marked baseline for future.

Forested wetland birds

Used as-is. Score = % rated as 1, 2, or 3.

Freshwater Aquatic

Permeable surface

Used as-is under the name "impervious surface". Score = % rated as 2.

Riparian buffers

Used as-is. Score = % rated as 4.

Freshwater Marsh

Freshwater marsh birds

Used as-is. Score = % rated as 1, 2, or 3.

Freshwater marsh extent

Not scored, marked baseline for future.

Landscapes

Structural connectivity

Used as-is. Score = % in hub or corridor.

Resilient biodiversity hotspots

Not scored, marked baseline for future.

Low-urban historic landscapes

Used as-is. Linear feature errors identified in this indicator during the review of Blueprint 2.0 were not removed prior to the *State of the South Atlantic 2015*.

Low road density

Used as-is. Score = % rated as 1/area of all historic places.

Marine

Marine turtles and mammals

Not scored, marked baseline for future.

Primary productivity

Different spatial data was used with 3 classes instead of 2, where the lowest category represented productivity potentially too high from human impacts. Score = % rated as 0 or 1 (lower or medium/high productivity, likely due to natural processes).

Potential hardbottom condition

Used as-is. Score = % rated as 2 or 3/area of hardbottom.

Maritime Forest

Maritime forest extent

Not scored, marked baseline for future.

Pine & Prairie

Regularly burned habitat

Used as-is. Score = % rated as 1.

Pine and prairie amphibians

Not scored, marked baseline for future.

Pine and prairie birds

Used as-is. Score = % rated 1, 2, or 3.

Upland hardwood

Upland hardwood birds

Used as-is. Score = % rated as 3 or 4.

Urban open space

Not scored, marked baseline for future.

Waterscapes

Resident fish connectivity

Used as-is. Score = % rated as 4.

Fresh and saltwater connectivity

Used as-is. Score = % rated as 4.

Detailed indicator scores

Table 2. Detailed indicator scores for each analysis unit in the *State of the South Atlantic 2015*.

	Central Coastal Plain	Gulf Coastal Plain	North Coastal Plain	North Piedmont	South Coastal Plain	South Piedmont	Marine	Entire South Atlantic	Confidence
Landscapes	0.43	0.45	0.45	0.36	0.47	0.40	N/A	0.43	3
Low road density	0.14	0.28	0.15	0.03	0.18	0.13	N/A	0.16	
Low-urban historic landscapes	0.89	0.65	0.82	0.69	0.80	0.63	N/A	0.74	
Structural connectivity	0.25	0.43	0.38	0.36	0.44	0.43	N/A	0.40	
Resilient biodiversity hotspots	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	N/A	Baseline	
Beach and Dune	0.36	0.55	0.50	N/A	0.60	N/A	N/A	0.54	2
Beach birds	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	N/A	Baseline	
Beach alteration*	0.15	0.66	0.62	N/A	0.55	N/A	N/A	0.53	
Low road density	0.10	0.10	0.16	N/A	0.16	N/A	N/A	0.15	
Low-urban historic landscapes	0.92	1.00	0.56	N/A	0.98	N/A	N/A	0.88	
Structural connectivity	0.26	0.44	0.65	N/A	0.72	N/A	N/A	0.60	

Forested Wetland	0.52	0.57	0.64	0.33	0.53	0.36	N/A	0.49	3	
Forested wetland extent	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline		N/A	Baseline	
Forested wetland birds	0.79	0.69	0.76	0.27	0.81	0.31		N/A	0.61	
Forested wetland amphibians	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline		N/A	Baseline	
Low road density	0.23	0.38	0.31	0.05	0.25	0.22		N/A	0.28	
Low-urban historic landscapes	0.98	0.96	0.97	0.95	0.91	0.90		N/A	0.95	
Structural connectivity	0.39	0.59	0.42	0.55	0.53	0.60		N/A	0.50	
Resilient biodiversity hotspots	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline		N/A	Baseline	
Fresh & saltwater connectivity	0.34	0.34	0.69	0.01	0.33	0.01		N/A	0.29	
Resident fish connectivity	0.41	0.44	0.72	0.16	0.34	0.13		N/A	0.34	
Freshwater Aquatic	0.54	0.61	0.67	0.32	0.57	0.29		N/A	0.49	2
Riparian buffers	0.50	0.68	0.34	0.20	0.69	0.19		N/A	0.43	
Impervious surface^	0.93	0.97	0.95	0.90	0.92	0.83		N/A	0.91	

Fresh & saltwater connectivity	0.34	0.34	0.69	0.01	0.33	0.01	N/A	0.29	
Resident fish connectivity	0.41	0.44	0.72	0.16	0.34	0.13		N/A	0.34
Marine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.76	1
Marine turtles and mammals	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Baseline	
Potential hardbottom condition	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.00	
Primary productivity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.96	
Fresh & saltwater connectivity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.32	
Pine & Prairie	0.38	0.40	0.31	N/A	0.39	N/A	N/A	0.37	2
Longleaf pine extent	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	N/A	Baseline	
Pine & prairie birds	0.71	0.57	0.61	N/A	0.51	N/A	N/A	0.60	
Pine & prairie amphibians	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	N/A	Baseline	
Regularly burned habitat	0.17	0.29	0.07	N/A	0.33	N/A	N/A	0.21	
Low road density	0.10	0.24	0.07	0.14	0.16	0.21	N/A	0.17	

Low-urban historic landscapes	0.79	0.56	0.69	0.43	0.61	0.58	N/A	0.64		
Structural connectivity	0.15	0.35	0.10	0.54	0.34	0.57		N/A	0.32	
Resilient biodiversity hotspots	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline		N/A	Baseline	
Freshwater Marsh	0.53	0.57	0.61	0.40	0.55	0.40		N/A	0.51	2
Freshwater marsh extent	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline		N/A	Baseline	
Freshwater marsh birds	0.56	0.54	0.66	0.44	0.53	0.41		N/A	0.52	
Fresh & saltwater connectivity	0.34	0.34	0.69	0.01	0.33	0.01		N/A	0.29	
Resident fish connectivity	0.41	0.44	0.72	0.16	0.34	0.13		N/A	0.34	
Riparian buffers	0.50	0.68	0.34	0.20	0.69	0.19		N/A	0.43	
Impervious surface^	0.93	0.97	0.95	0.90	0.92	0.83		N/A	0.91	
Low road density	0.19	0.25	0.31	0.03	0.23	0.16		N/A	0.24	
Low-urban historic landscapes	0.99	0.98	0.80	1.00	0.94	0.94		N/A	0.95	
Structural connectivity	0.34	0.35	0.41	0.46	0.43	0.55		N/A	0.40	

Resilient biodiversity hotspots	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	N/A	Baseline	
Waterscapes	0.37	0.39	0.70	0.08	0.34	0.07	N/A	0.32	2
Index of fresh and saltwater connectivity	0.34	0.34	0.69	0.01	0.33	0.01	N/A	0.29	
Index of resident fish connectivity	0.41	0.44	0.72	0.16	0.34	0.13	N/A	0.34	
Upland Hardwood	N/A	N/A	N/A	0.39	N/A	0.36	N/A	0.37	3
Index of upland hardwood birds	N/A	N/A	N/A	0.52	N/A	0.36	N/A	0.44	
Index of urban open space	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	N/A	Baseline	
Low road density	N/A	N/A	N/A	0.02	N/A	0.10	N/A	0.06	
Low-urban historic landscapes	N/A	N/A	N/A	0.69	N/A	0.62	N/A	0.65	
Structural connectivity	N/A	N/A	N/A	0.34	N/A	0.36	N/A	0.34	
Resilient biodiversity hotspots	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	N/A	Baseline	

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