



Southeast Conservation Adaptation Strategy

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The Southeast Blueprint Changelog

What has changed with each version of the Southeast Blueprint?

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What is a Changelog?

Changelogs are commonly used in software development. According to the [Keep a Changelog project](#), a changelog contains “a curated, chronologically ordered list of notable changes for each version of a project.” Changelogs make it easier for both project users and project contributors to see what notable changes have been made between each version. When something changes, people often want to know both why and how. Here, we’re applying these principles to the Southeast Blueprint.

The Evolution of the Southeast Blueprint

As a living spatial plan, the Southeast Blueprint has evolved over time through an iterative revision process, improving its accuracy, spatial extent, consistency, and utility to conservation professionals. This changelog is intended to capture the changes made to the Southeast Blueprint since the first version was released in December 2016.

<ul style="list-style-type: none">Consistent methods/data, hubs/corridors for full SECAS region								Southeast Blueprint 2023
<ul style="list-style-type: none">Consistent methods/data, hubs/corridors for 15 statesIntegrates 3 plans							Southeast Blueprint 2022	
<ul style="list-style-type: none">Expanded to FL marineIntegrates 10 plansHubs/corridors include FL				Southeast Blueprint 4.0	Southeast Blueprint 2020	Southeast Blueprint 2021		
<ul style="list-style-type: none">Expanded to all of TXIntegrates 10 plansPartial hubs/corridors			Southeast Blueprint 3.0					
<ul style="list-style-type: none">Expanded to all of OKIntegrates 9 plans		Southeast Blueprint 2.0						
<ul style="list-style-type: none">Covers SECAS region except eastern TX/OK, USVIIntegrates 8 plans	Southeast Blueprint 1.0							
	2016	2017	2018	2019	2020	2021	2022	2023

Figure 1. Major changes to the Southeast Blueprint over time.

Southeast Blueprint 2023

Version 2023 of the Southeast Blueprint was released in October 2023. This version expanded consistent methods and indicators to Puerto Rico, the U.S. Virgin Islands, and the surrounding nearshore waters of the U.S. Caribbean, as well as the full U.S. offshore waters of the Atlantic Ocean and Gulf of Mexico within the SECAS geography. For the first time, the Blueprint no longer needed to stitch together any distinct subregional plans.

As a result, the Florida Marine Blueprint and Caribbean Landscape Conservation Design were no longer used as inputs, and it was no longer necessary to provide an “input areas” layer to depict where different inputs were used. The rest of the Blueprint 2023 changelog chapter will focus on changes between Base Blueprint 2022, which was used as the main input to Southeast Blueprint 2022 across 15 states and a portion of the Atlantic marine environment, and Southeast Blueprint 2023.

Changes to the Indicators

Improvements to the Overall Indicator Approach

- Many new indicators were added to cover Puerto Rico, the U.S. Virgin Islands, and parts of the U.S. Caribbean marine environment. Where relevant, we developed Caribbean equivalents for as many of the continental indicators as possible, though the Caribbean analogs often use different data sources due to differences in data availability, as well as lower thresholds for size or length to reflect the smaller size of the Caribbean islands. We also developed several unique indicators specific to the ecosystems and resources of the U.S. Caribbean.
- Many new indicators were added to cover the full extent of the U.S. offshore marine environment in the Atlantic Ocean and Gulf of Mexico within the SECAS geography. Past indicators that previously only extended to the portion of the Atlantic marine environment covered by Base Blueprint 2022 were expanded to the full Atlantic.
- Indicators in Base Blueprint 2022 that were not used across their full extent (due to an oversight in which indicators were included in each subregional Zonation run) were used across their full extent and included in all subregional Zonation runs where they occurred.
- We added meaningful 0 values to as many of the 2023 indicators as possible to better represent the extent of the source data and make them perform better in online tools. This allows users to better distinguish between places not evaluated by an indicator at all (which receive a value of NoData), and places where an indicator was assessed but found not to occur there (which receive a value of 0).

Summary of Indicator Changes

Table 1. The 61 indicators that drive priority in Southeast Blueprint 2023 and their changes from Base Blueprint 2022. Changes are represented by:

o - the indicator was included in a previous Blueprint version and did not change

Δ - the indicator changed from a previous version

- - the indicator has been removed/replaced and is no longer used in this version of the Blueprint

+ - the indicator is new and not included in previous Blueprint versions

Category	Southeast Blueprint 2023 Indicator	Status	Changes from Base Blueprint 2022
Terrestrial	Caribbean greenways & trails	+	New indicator added
	Caribbean habitat patch size (large islands)	+	New indicator added
	Caribbean habitat patch size (small islands)	+	New indicator added
	Caribbean island habitat	+	New indicator added
	Caribbean karst habitat	+	New indicator added
	Caribbean landscape condition	+	New indicator added
	Caribbean low-urban historic landscapes	+	New indicator added
	Caribbean reforestation potential	+	New indicator added
	Caribbean urban park size	+	New indicator added
	East Coastal Plain open pine birds	Δ	Added 0 class to define analysis extent; used across full indicator extent
	Equitable access to potential parks	Δ	Added 0 class
	Fire frequency	Δ	Removed marine areas from 0 class
	Great Plains perennial grasslands	o	No change
	Greenways & trails	Δ	Updated to newer version of source data; improved method of distinguishing trails from sidewalks; added 0 class
	Intact habitat cores	Δ	Removed marine areas from 0 class
	Interior Southeast grasslands	o	No change

Category	Southeast Blueprint 2023 Indicator	Status	Changes from Base Blueprint 2022
Terrestrial	Mississippi Alluvial Valley forest birds - protection	Δ	Added 0 class to define analysis extent; used across full indicator extent
	Mississippi Alluvial Valley forest birds - reforestation	Δ	Added 0 class to define analysis extent; used across full indicator extent
	Playas	Δ	Added 0 class to define analysis extent
	Resilient terrestrial sites	o	No change
	South Atlantic amphibian & reptile areas	Δ	Removed marine areas from 0 class; used full PARCA polygons instead of clipping to South Atlantic LCC boundary; used across full indicator extent
	South Atlantic forest birds	Δ	Used across full indicator extent
	South Atlantic low-urban historic landscapes	Δ	Used across full indicator extent
	Urban park size	Δ	Added 0 class to define analysis extent; buffered small parks; improved methods to capture large contiguous park complexes
	West Coastal Plain & Ouachitas forested wetland birds	Δ	Used across full indicator extent; added 0 class to define analysis extent
	West Coastal Plain & Ouachitas open pine birds	Δ	Used across full indicator extent; added 0 class to define analysis extent
	West Gulf Coast mottled duck nesting	Δ	Used across full indicator extent; added 0 class to define analysis extent
Freshwater	Atlantic migratory fish habitat	Δ	Used across full indicator extent
	Caribbean natural landcover in floodplains	+	New indicator added
	Caribbean network complexity	+	New indicator added
	Caribbean permeable surface	+	New indicator added
	Gulf migratory fish connectivity	Δ	Added 0 class to define analysis extent; used across full indicator extent

Category	Southeast Blueprint 2023 Indicator	Status	Changes from Base Blueprint 2022
Freshwater	Imperiled aquatic species	Δ	Updated to newer version of source data; modified 0 class to define analysis extent and renumbered other classes
	Natural landcover in floodplains	Δ	Added 0 class to define analysis extent
	Network complexity	Δ	Added 0 class to define analysis extent; updated to newer version of source data; expanded to all of WV; filled gaps in catchments with braided streams/loops; switched from medium to high resolution catchments to better align with flowlines
	Permeable surface	o	No change
	West Virginia imperiled aquatic species	Δ	Modified 0 class to define analysis extent and renumbered other classes; changed top class from 5 species to 4+
Coastal & marine	Atlantic coral and hardbottom	+	New Atlantic coral and hardbottom indicator replaced South Atlantic hardbottom and deep-sea coral
	South Atlantic hardbottom & deep-sea coral	-	
	Atlantic deep-sea coral richness	+	New indicator added
	Atlantic estuarine fish habitat	Δ	Used across full indicator extent; added data for FL
	Atlantic marine birds	+	New Atlantic-wide marine birds indicator replaced South Atlantic marine birds
	South Atlantic marine birds	-	
	Atlantic marine mammals	+	New Atlantic-wide marine mammals indicator replaced South Atlantic marine mammals
	South Atlantic marine mammals	-	
	Caribbean beach habitat	+	New indicator added
	Caribbean coastal shoreline condition	+	New indicator added
	Caribbean fish hotspots	+	New indicator added
	Caribbean fish nursery habitat	+	New indicator added
	Caribbean seagrass	+	New indicator added

Category	Southeast Blueprint 2023 Indicator	Status	Changes from Base Blueprint 2022
Coastal & marine	Caribbean shallow hardbottom & coral	+	New indicator added
	Coastal shoreline condition	Δ	Used across full indicator extent
	Estuarine coastal condition	Δ	Added 0 class to define analysis extent; extended further offshore into marine areas
	Gulf coral & hardbottom	+	New indicator added
	Gulf deep-sea coral richness	+	New indicator added
	Gulf marine mammals	+	New indicator added
	Gulf sea turtles	+	New indicator added
	Island habitat	Δ	Previously named islands (added habitat for clarity and consistency with Caribbean version); used across full indicator extent
	Marine highly migratory fish	+	New indicator added
	Resilient coastal sites	Δ	Used across full indicator extent
	Seagrass	+	Previously named seagrasses (made singular for consistency with Caribbean version); updated to newer version of source data
	South Atlantic beach birds	Δ	Improved spatial resolution; removed areas of poor data coverage in VA and the Gulf coast; used across full indicator extent
	South Atlantic maritime forest	Δ	Added 0 class to define analysis extent; used across full data extent; clipped to subregions rather than South Atlantic LCC boundary
	Stable coastal wetlands	Δ	Added 0 class to define analysis extent; modified 1 class to cover other coastal wetlands not identified as stable and renumbered top class to 2

New Indicators Added

Continental

Many new indicators were developed for the continental marine area as part of expanding the Blueprint to the rest of the offshore waters of the Atlantic and Gulf.

Coastal & Marine

- **Atlantic coral and hardbottom** was added as a new coastal and marine indicator, replacing South Atlantic hardbottom and deep-sea coral. This new indicator expanded its spatial extent to all U.S. Atlantic waters within the SECAS geography, expanded its scope to consider human-created hardbottom habitat, and used slightly different data sources. We removed the NOAA deep-sea coral predictive habitat modeling data used in the previous version because newer National Oceanic and Atmospheric Administration (NOAA) data became available that depicted coral diversity, rather than the likelihood of occurrence for different taxa. This component split off into a different indicator called Atlantic deep-sea coral richness. We added several new datasets to Atlantic coral and hardbottom: newer NOAA hardbottom data from a recent deep-sea coral and hardbottom project, data on the cold-water coral mounds of the Blake Plateau provided by Dr. Derek Sowers, and NOAA shipwrecks and artificial reefs. This indicator continued to use The Nature Conservancy's (TNC) South Atlantic Bight Marine Assessment data, but only included the observed hardbottom polygons and not the high confidence, probable, potential, and possible hardbottom classes. It was too difficult to integrate these with the new NOAA hardbottom data, which used a different probabilistic approach. We continued to use the unpublished NOAA hardbottom data for shallower waters, but used the final logistic prediction layer classified into quantiles, rather than the thresholded logistic outputs, because that was more consistent with the new NOAA hardbottom data (based on guidance from Dr. Matt Poti). We also continued to use NOAA deep-sea coral point locations, but updated to a fresh download of that dataset to integrate any new points that had been added since the previous version. To accommodate these new and modified data sources, we changed our approach to scoring the indicator.
- **Atlantic deep-sea coral richness** was added as a new coastal and marine indicator to represent areas of high predicted deep-sea coral diversity. It is intended to complement Atlantic coral and hardbottom.
- **Atlantic marine birds** was added as a new coastal and marine indicator, replacing South Atlantic marine birds. This indicator expanded its spatial extent to all U.S. Atlantic waters within the SECAS geography. It used 10 distinct bins instead of a continuous ranking. We removed land to a separate class where the bird models overlapped with land areas identified in the National Land Cover Database. The new indicator also incorporated the latest source data from the Duke University's Marine-life Data and Analysis Team. The updated bird models allowed us to include three new species (bridled tern, parasitic jaeger, sooty tern), but also introduced an artifact for one species that we therefore had to remove (horned grebe). We

also resolved an error in the documentation that incorrectly referred to the brown pelican model as the Bermuda petrel model in previous iterations of the South Atlantic marine birds indicator. We mention this in the changelog to clarify that brown pelican was used across both versions, and did not replace the Bermuda petrel model as comparing the two versions of the documentation might suggest.

- **Atlantic marine mammals** was added as a new coastal and marine indicator, replacing South Atlantic marine mammals. This indicator expanded its spatial extent to all U.S. Atlantic waters within the SECAS geography. It used 10 distinct bins instead of a continuous ranking. The new indicator also incorporated the latest source data from the Duke Marine Lab, which used additional survey information and improved analysis methods and improved the spatial resolution from 10 km pixels to 5 km pixels. Using the latest models allowed us to include several new species, including seals, Atlantic spotted dolphin, Clymene dolphin, dwarf and pygmy sperm whales, pantropical spotted dolphin, and rough-toothed dolphin. The older beaked whale model was retired and replaced by three more taxonomically specific models for Cuvier's beaked whale, mesoplodont beaked whales, and unidentified beaked whales. Finally, we dropped the Sei whale model as the newer version introduced an artifact. The finer spatial scale of the new models allowed us to extend the indicator into nearshore waters, instead of clipping it to the marine subregions. As part of extending it nearshore, we removed land to a separate class where the mammal models overlapped with land areas identified in the National Land Cover Database.
- **Gulf coral and hardbottom** was added as a new coastal and marine indicator to capture the presence of coral and hardbottom in the Gulf. This is an analog to Atlantic coral and hardbottom.
- **Gulf deep-sea coral richness** was added as a new coastal and marine indicator to represent areas of high predicted deep-sea coral diversity in the Gulf. It is intended to complement Gulf coral and hardbottom.
- **Gulf marine mammals** was added as a new coastal and marine indicator to capture important areas in the Gulf for dolphins and whales. This is an analog to Atlantic marine mammals.
- **Gulf sea turtles** was added as a new coastal and marine indicator to capture important areas in the Gulf of Mexico for sea turtles.
- **Marine highly migratory fish** was added as a new coastal and marine indicator to represent important foraging and spawning areas for highly migratory fish across the Atlantic and Gulf.

Caribbean

We developed many new indicators for the U.S. Caribbean in order to expand the Blueprint to Puerto Rico, the U.S. Virgin Islands, and the surrounding nearshore marine environment.

Terrestrial

- **Caribbean greenways and trails** was added as a new terrestrial indicator to capture the outdoor recreation and cultural resource value of greenways and trails in the U.S. Caribbean. This is an analog to the continental greenways and trails indicator, but uses some different source data and a lower maximum length threshold.
- **Caribbean habitat patch size (large islands)** was added as a new terrestrial indicator to capture natural habitat patches on large islands in the U.S. Caribbean. This is an analog to the continental intact habitat cores indicator, but uses different source data.
- **Caribbean habitat patch size (small islands)** was added as a new terrestrial indicator to capture natural habitat patches on small islands in the U.S. Caribbean. This is an analog to the continental intact habitat cores indicator, but uses different source data and a lower maximum size threshold.
- **Caribbean island habitat** was added as a new terrestrial indicator to represent the importance of island habitat for federally listed and other imperiled species in the U.S. Caribbean. This is an analog to the continental island habitat indicator, but uses some different source data and approaches.
- **Caribbean karst habitat** was added as a new terrestrial indicator to represent natural karst areas with limited human alteration in the U.S. Caribbean.
- **Caribbean landscape condition** was added as a new terrestrial indicator for the U.S. Caribbean to represent natural areas with limited human alteration while also considering the natural landcover of the surrounding landscape. It is complementary to the Caribbean habitat patch size indicators, which treat roads and developed areas as hard barriers rather than considering overall landscape permeability.
- **Caribbean low-urban historic landscapes** was added as a new terrestrial indicator to represent historic and cultural sites in the U.S. Caribbean that are surrounded by limited urban development. This is an analog to the continental South Atlantic low-urban historic landscapes indicator, but uses different source data.
- **Caribbean reforestation potential** was added as a new terrestrial indicator to represent opportunities to increase tree cover in the U.S. Caribbean based on current land uses and potential benefits for local drinking water supplies. It recognizes the important role that shade-grown coffee plays in the ecological and economic health of the region.
- **Caribbean urban park size** was added as a new terrestrial indicator to represent the cultural and recreational value of parks in urban areas in the U.S. Caribbean. This is an analog to the continental urban park size indicator, but uses some different source data and approaches.

Freshwater

- **Caribbean natural landcover in floodplains** was added as a new freshwater indicator to represent the amount of natural landcover in the estimated floodplain of rivers and streams within each catchment in the U.S. Caribbean. This is an analog to the continental natural landcover in floodplains indicator, but uses some different source data.
- **Caribbean network complexity** was added as a new freshwater indicator to capture the number of connected stream size classes in a river network between dams or waterfalls in the U.S. Caribbean. This is an analog to the continental network complexity indicator.
- **Caribbean permeable surface** was added as a new freshwater indicator to represent the average percent of non-impervious cover within each catchment in the U.S. Caribbean. This is an analog to the continental permeable surface indicator, but uses some different source data.

Coastal & Marine

- **Caribbean beach habitat** was added as a new coastal and marine indicator to represent the value of beaches that provide habitat for beach-nesting birds and sea turtles in the U.S. Caribbean.
- **Caribbean coastal shoreline condition** was added as a new coastal and marine indicator to assess shoreline alteration along the U.S. Caribbean coast. This is an analog to the continental shoreline condition indicator, but uses different source data and approaches.
- **Caribbean fish hotspots** was added as a new coastal and marine indicator to represent areas of high predicted fish density and diversity in the U.S. Caribbean where mangroves, seagrass, and coral occur in close proximity to one another.
- **Caribbean fish nursery habitat** was added as a new coastal and marine indicator to capture nursery and spawning habitat and other concentration areas for fish in the U.S. Caribbean.
- **Caribbean seagrass** was added as a new coastal and marine indicator to capture the presence and density of seagrass at various depths in the U.S. Caribbean. This is an analog to the continental seagrass indicator, but uses different source data and approaches.
- **Caribbean shallow hardbottom and coral** was added as a new coastal and marine indicator to represent hardbottom habitat and coral in the U.S. Caribbean and predict the ability of coral to survive the impacts of climate change. This is an analog to the Atlantic and Gulf coral and hardbottom indicators, but uses different source data and approaches.

Old Indicators Removed

Continental

Coastal & Marine

- **South Atlantic hardbottom and deep-sea coral** was removed as an indicator, replaced by Atlantic coral and hardbottom (see New Indicators Added section above).
- **South Atlantic marine birds** was removed as an indicator, replaced by Atlantic marine birds (see New Indicators Added section above).
- **South Atlantic marine mammals** was removed as an indicator, replaced by Atlantic marine mammals (see New Indicators Added section above).

Indicators Changed

Continental

Terrestrial

- **East Coastal Plain open pine birds** was updated to add a 0 class based on the extent of the source data. The indicator now more clearly shows the extent of the bird model from the East Gulf Coastal Plain Joint Venture. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was restored to its full extent and no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **Equitable access to potential parks** was updated to add a 0 class to better show the analysis extent of the indicator. Because of the multiple interacting source datasets, the 0 class includes three types of areas: a) not assessed by ParkServe because it not in an urban area, b) assessed by ParkServe and found to be a low priority for a new park, or c) not in a socially vulnerable community.
- **Fire frequency** was updated to remove marine areas from the 0 class to show that marine areas are outside the scope of this terrestrial indicator.
- **Greenways & trails** was updated to a fresh download of the source data from OpenStreetMap to incorporate any new greenways, trails, sidewalks, and other paths that had been added since the previous version. We also used an improved method for distinguishing greenways and trails from sidewalks. Instead of using the name attribute to identify trails, we extracted all paths with a sidewalk tag to the sidewalk class and entirely removed all paths marked as private. All remaining bridleways, cycleways, footways, and paths were considered as greenways and trails and scored according to their connected length and natural condition.
- **Intact habitat cores** was updated to remove marine areas from the 0 class to better show that marine areas are outside the scope of this terrestrial indicator.

- **Mississippi Alluvial Valley forest birds – protection** was updated to add a 0 class based on the extent of the source data. The indicator now more clearly shows the extent of the bird model from the Lower Mississippi Valley Joint Venture. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was restored to its full extent and no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **Mississippi Alluvial Valley forest birds - reforestation** was updated to add a 0 class based on the extent of the source data. The indicator now more clearly shows the extent of the bird model from the Lower Mississippi Valley Joint Venture. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was restored to its full extent and no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **Playas** was updated to add a 0 class based on the boundary of the Playa Lakes Joint Venture, which provided the source data for this indicator.
- **South Atlantic amphibian & reptile areas** was updated to remove marine areas from the 0 class to show that marine areas are outside the scope of this terrestrial indicator. In addition, rather than clipping the Priority Amphibian and Reptile Conservation Areas (PARCAs) to the South Atlantic Landscape Conservation Cooperative (LCC) boundary, we kept the portions of all PARCAs that extended across the LCC border. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was restored to its full extent and no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **South Atlantic forest birds** was restored to its full extent. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **South Atlantic low-urban historic landscapes** was restored to its full extent. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **Urban park size** was updated to add a 0 class based on the extent of the source data. We also made minor methods refinements to be more consistent with the approach used in the newly developed Caribbean version of the indicator. We buffered small parks that might otherwise be lost in the conversion from vector to raster. Compared to the previous version, this better represented small and/or linear features like Tallahassee-St. Marks Historic Railroad State Trail in the Big Bend of FL and Kingwood Greenway near Houston, TX. We also dissolved contiguous park units in an earlier step, which resulted in the inclusion of larger park complexes like Croatan National Forest in NC and Jean Lafitte National Wildlife Refuge in LA, whereas the previous version captured only discrete units of that park.
- **West Coastal Plain & Ouachitas forested wetland birds** was updated to add a 0 class based on the extent of the source data. The indicator now more clearly shows the extent of the bird

model from the Lower Mississippi Valley Joint Venture. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was restored to its full extent and no longer clipped down to the subregions in which it was used in Blueprint 2022.

- **West Coastal Plain & Ouachitas open pine birds** was updated to add a 0 class based on the extent of the West Gulf Coastal Plain/Ouachitas Bird Conservation Region. The indicator now more clearly shows the extent of the bird model from the Lower Mississippi Valley Joint Venture. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was restored to its full extent and no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **West Gulf Coast mottled duck nesting** was updated to add a 0 class based on the extent of the source data. The indicator now more clearly shows the extent of the bird model from the Gulf Coast Joint Venture. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was restored to its full extent and no longer clipped down to the subregions in which it was used in Blueprint 2022.

Freshwater

- **Atlantic migratory fish habitat** was restored to its full extent. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **Gulf migratory fish connectivity** was updated to add a 0 class based on Gulf HUC6 watersheds, defining the analysis extent of the indicator. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **Imperiled aquatic species** was updated to add a 0 class representing all inland areas of the continental Southeast not identified as a floodplain. As the previous version of the indicator already had a 0 class depicting areas where 0 species had been observed, we reassigned that class a value of 1 and renumbered accordingly. We also updated to a fresh download of the source data from the Southeast Aquatic Resources Partnership (SARP), which had collected new data from many state National Heritage Programs since the last Blueprint update.
- **Natural landcover in floodplains** was updated to add a 0 class representing all inland areas of the continental Southeast not identified as a floodplain.
- **Network complexity** was updated to add a 0 class representing all inland areas of the continental Southeast not identified as a floodplain. We also updated to a fresh download of the source data from SARP. Because more source data was available for WV, we expanded this indicator to the entirety of WV whereas the previous version only covered the southern part of the state. We applied SARP's functional network lines to high resolution catchments instead of medium resolution catchments because the high resolution version aligned better with the linework. Finally, we attempted to fill gaps from the previous version of the indicator in places

where river networks contain loops or braided streams. Because SARP's network complexity analysis can only accommodate a one-way flow of water, they remove braided streams and loops from their calculations. As a result, some floodplain areas in the previous version of the indicator were missing a network complexity value. This year, we addressed this by identifying unscored floodplain areas and filling them in using the highest network complexity value from the surrounding pixels. This significantly improved the indicator in areas with complex or heavily modified hydrology, such as coastal Louisiana.

- **West Virginia imperiled aquatic species** was updated to add a 0 class representing all inland areas of the continental Southeast not identified as a floodplain. As the previous version of the indicator already had a 0 class depicting areas where 0 species had been observed, we reassigned that class a value of 1 and renumbered accordingly. In the source data, no areas within WV receive a value of 4 species observed, so in the previous version of the Blueprint, we skipped the number 4 in the legend, going directly from 3 species observed to 5 species observed. While this was accurate, the missing 4 value caused confusion for users and in online tools. As a result, in this update, we renumbered so that the highest value of the indicator is 4+ species observed to maintain the consecutive order of the classes.

Coastal & Marine

- **Atlantic estuarine fish habitat** was updated to include additional source data from the Atlantic Coast Fish Habitat Partnership that covered estuaries in southern FL. This additional input is analogous to the South Atlantic and Mid-Atlantic datasets already used in the previous version of the indicator, but had not been needed in previous iterations of this indicator when it only covered the South Atlantic. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **Coastal shoreline condition** was restored to its full extent. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **Estuarine coastal condition** was extended further offshore to include all estuarine waters shallower than 10 m in depth now that the Blueprint covers all U.S. marine waters within the SECAS geography. Previously, it was cut off at the boundary of the coastal Blueprint subregions. We also added a 0 class to better distinguish between estuarine areas that do not contain a National Coastal Condition Assessment sampling point and therefore are in unknown condition, and areas that are outside the extent of estuaries.
- **Islands** was renamed **island habitat** for consistency with the Caribbean version of the indicator. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was no longer clipped down to the subregions in which it was used in Blueprint 2022.

- **Resilient coastal sites** was restored to its full extent. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **Seagrasses** was renamed **seagrass** for consistency with the Caribbean version of the indicator. We also updated it to a fresh download of the source data from the NOAA Marine Cadastre to incorporate any seagrass areas that had been added since the previous version. It was extended further offshore to include all source data within the continental SECAS geography, now that the Blueprint covers all U.S. marine waters in the Gulf and Atlantic. Previously, it was cut off at the boundary of the coastal Blueprint subregions.
- **South Atlantic beach birds** was updated to improve the spatial resolution by recalculating the indicator from the original bird data for Wilson’s plover and American oystercatcher, and intermediate 90 m outputs for least tern and piping plover. The previous version of this indicator was resampled from a 200 m layer dating back to South Atlantic Blueprint 2.0. We also clipped out areas with poor data coverage in Virginia and the South Atlantic portion of the Gulf coast. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **South Atlantic maritime forest** was updated to add a 0 class to represent the extent of the indicator. We modified that extent from the previous version by applying it to the Blueprint subregions that roughly correspond to the South Atlantic LCC geography, instead of the exact South Atlantic LCC boundary. This extended the indicator to parts of Virginia that were not covered in the previous version. The new extent is more ecologically than administratively based, while staying broadly within the portion of the SECAS region where it has received expert review. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was no longer clipped down to the subregions in which it was used in Blueprint 2022.
- **Stable coastal wetlands** was updated to add a 0 class based on the extent of the source data. We also repurposed the 1 class to encompass other coastal wetlands that were not identified as stable, to better depict all assessed wetlands. The top stable coastal wetlands class was renumbered accordingly to a value of 2. Since we corrected the oversight from the previous Blueprint where indicators were not used everywhere they occurred, this indicator was no longer clipped down to the subregions in which it was used in Blueprint 2022.

Changes to Connectivity

We continued to use Linkage Mapper for our connectivity analysis in Southeast Blueprint 2023.

- We upgraded to use the latest version of Linkage Mapper, version 3.1.0. The previous version of the Blueprint used Linkage Mapper 3.0.
- Hubs and corridors were expanded to new areas of the Blueprint—U.S. Gulf and Atlantic offshore waters, Puerto Rico and the U.S. Virgin Islands, and the surrounding nearshore marine environment of the U.S. Caribbean.
- Southeast Blueprint 2023 priorities were used to define the hubs and resistance rasters across the inland continental, marine continental, and Caribbean connectivity analyses.

Continental

Inland Hubs & Corridors

We made several changes to the inland continental connectivity analysis:

- We made a minor refinement to our wildlife road crossing methods. We lowered the resistance value of the roads surrounding the road crossings from 500 to 150. This allowed us to use a 4-bit raster for the resistance raster rather than an 8-bit, which reduced file size and potentially sped up the analysis.
- We used the same size of hexagons in the inland connectivity analysis as in the previous version, but their placement shifted slightly so that the hexagons do not align across 2022 and 2023. This did not affect the final results.

Marine/Estuarine Hubs & Corridors

We made several changes to the marine/estuarine continental hubs and corridors analysis:

- Marine hubs and corridors were expanded to the full Gulf and Atlantic offshore marine environment. The previous Blueprint's marine connectivity analysis was restricted to a portion of the Atlantic marine environment.
- The previous marine mammal movement zones became marine mammal and turtle movement zones and used new and updated source data. The Atlantic marine mammal data was updated to the latest models from the Duke Marine Lab used in the new Atlantic marine mammals indicator. The three Atlantic species used in 2022 were North Atlantic right whale, sperm whale, and humpback whale. The 2023 movement zones continued to use right whale and humpback whale, but replaced sperm whale with pilot whale, keeping the same abundance thresholds. To expand this layer to the Gulf, we also incorporated four species models (Rice's whale, pilot whale, Kemp's ridley sea turtle, and loggerhead sea turtle) from the Gulf of Mexico Marine Assessment Program for Protected Species (GoMMAPPS) used in the new Gulf marine mammals and Gulf sea turtles indicators.

Caribbean

- Hubs and corridors were expanded to the U.S. Caribbean. These were run in a separate Caribbean connectivity analysis. Because this analysis was new for 2023, there is no previous version to compare it to. However, it is important to note that, compared to the continental hubs and corridors approach, the Caribbean connectivity analysis used much simpler methods. It ran all hubs and all corridors together in one seamless analysis, rather than running marine and inland areas separately. It did not use all nearshore estuaries as hubs, and did not use marine mammal movement zones to constrain the resistance raster. We intend to build on these simpler methods as a model for streamlining the continental connectivity analysis in future Blueprint updates. The Caribbean hubs also used a smaller size threshold to reflect the smaller size of the geography compared to the continental Southeast (200 ha/~500 ac instead of 2,000 ha/~5,000 ac).

Changes to the Zonation Results

Improvements to the Overall Zonation Modeling Approach

Blueprint 2023 continued to use Zonation to prioritize within subregions, with several improvements.

- Because Blueprint 2023 included new areas of the offshore marine environment and U.S. Caribbean, we modified the subregions used to run Zonation. We removed the previous Marine Shelf and Extension and Marine Gulf Stream subregions, which applied only to the portion of the Atlantic marine environment covered by Base Blueprint 2022. They were replaced by an Atlantic Marine subregion that covered the entire U.S. Atlantic marine environment within the SECAS geography. We added a new Gulf of Mexico subregion that covered the entire U.S. Gulf marine environment within the SECAS geography. We also added a new Caribbean subregion that covered Puerto Rico, the U.S. Virgin Islands, and the surrounding nearshore U.S. Caribbean marine environment.

Continental

Inland

In the inland continental area, Blueprint 2023 continued to use Zonation 4, with the same settings, to prioritize within the same subregions. However, we adjusted the weighing rules as follows:

- The goal of the Zonation weighting rules remained the same (to ensure that spatially limited indicators were not overprioritized and that significantly outdated indicator data had less of an influence). However, we had to add several new exceptions to the standard spatially limited indicator weighting rule to accomplish the first objective for Blueprint 2023.

- We modified the use of the spatially limited indicators rule for imperiled aquatic species in the High Plains and Tablelands subregion so that it was applied to ≥ 2 values instead of ≥ 1 . This increased the weight for the indicator in this subregion.
- The natural landcover in floodplains indicator in the Ouachita subregion fell on the other side of the spatially limited indicator weighting rule in 2023, which lowered its weight significantly compared to 2022. To maintain better consistency within the 2022 priorities in this subregion, we applied the spatially limited indicators weighting rule for indicators where the proportion of ≥ 1 values is ≤ 0.1 , instead of the one where the proportion of ≥ 1 values is 0.5 to 0.1.
- We resolved an error in the documentation that failed to capture a weighting rule that was also used in 2022. The Interior Southeast grasslands indicator needed an adjusted weight in the North Appalachians, South Appalachians, Piedmont, and Ozarks and Plains subregions. In these four subregions, where the top indicator class (known grasslands) covered less than 0.03% of the area, lower indicator values were having too strong of an impact on the subregion's priorities. To address this, we multiplied the weight of Interior Southeast Grasslands by 0.5 in those subregions. We mention this in the changelog to clarify that this is not a new rule for 2023, as comparing the two versions of the documentation might suggest.
- Because of the changes made to inland continental indicators in 2023, many of the indicator weights themselves changed. However, we did not document those here because the weights are highly variable from year to year. The changelog only captures changes to the rules that are used to calculate those weights.

Marine

The approach to running Zonation in the offshore marine area changed significantly, with new subregions, a new version of Zonation, and modified goals and rules for weighting indicators.

- We ran Zonation within a new combined Atlantic Marine and Gulf of Mexico subregion.
- In the new marine and Caribbean subregions, we used a new and improved version of Zonation: v5. Zonation 5 offers different settings and rules compared to Zonation 4, but we used the setting most consistent with the core-area Zonation algorithm used in the inland subregions. The most notable difference is that edge removal is no longer available in Zonation 5, which affects the aggregation of priorities in the final Blueprint. Zonation 5 also no longer requires specifying a warp factor. Zonation 5 is much faster and less computationally demanding than Zonation 4, which makes it possible to run across larger areas. We hope to use Zonation 5 for the entire Blueprint in the next update, but wanted to minimize changes in the inland subregions between version 2022 and 2023 because workshops for Blueprint 2023 focused on the Caribbean and marine areas.
- In the marine subregions, we added a new indicator weighting goal: balancing priorities across Gulf and Atlantic areas of the offshore U.S. marine environment. To achieve this, a new weighting rule was introduced that applies to indicators that cover only the Atlantic or Gulf.

We only weighted bird, mammal, and turtle indicators when the proportion of ≥ 1 values was less than 0.3. We also increased the weight of two indicators that were getting significantly underrepresented in the Blueprint priorities (Atlantic coral and hardbottom, Gulf deep-sea coral richness) from 0.3 to 0.75.

- Because of the changes made to marine continental indicators in 2023, many of the indicator weights themselves changed. However, we did not document those here because the weights are highly variable from year to year. The changelog only captures changes to the rules that are used to calculate those weights.

Caribbean

Because Base Blueprint 2022 did not cover any part of the U.S. Caribbean, there is no previous version in this area to compare Blueprint 2023 to. However, it is important to note that we ran the Caribbean Zonation analysis within a new Caribbean subregion that covered both inland and offshore areas, using Zonation 5 and the same settings as the continental marine analysis. In this subregion, we had only one goal for indicator weighting: to ensure spatially limited indicators were not overprioritized. We were able to use only the standard spatially limited indicators weighting rule: for indicators where the proportion of ≥ 1 values was 0.5 and higher, we set their weight to 1.0. No special exceptions were necessary.

Southeast Blueprint 2022

Version 2022 of the Southeast Blueprint was released in October 2022. This version used a fundamentally different approach. Instead of stitching together so many different subregional plans, we took major strides toward SECAS-wide consistency by using the same methods and data across all 15 Southeast states. This portion of the Southeast Blueprint is referred to as the "Base Blueprint". The Base Blueprint expanded and improved the approach used to develop the South Atlantic Blueprint. More detail on the differences between South Atlantic Blueprint 2021 and Base Blueprint 2022 is available in the [South Atlantic Blueprint Changelog](#).

At the highest level, significant improvements over the previous versions of the Southeast Blueprint include:

- Improved priorities across the 15-state Base Blueprint area
- A connectivity analysis covering all 15 SECAS states
- Improved priorities for the Florida marine environment

The 2022 Blueprint update also used different priority classes and wording. We switched from “conservation value” to “priorities for a connected network of lands and waters” based on feedback from SECAS staff, science communication professionals, Southeast Blueprint users, and [workshop attendees](#). This new wording better aligns with the SECAS vision statement.

In addition, because we no longer had to stitch together so many different input plans in 2022, we increased the number of priority classes to match those used in the Base Blueprint. Instead of two classes, highest and high conservation value, the 2022 Blueprint has four to better stratify the landscape: highest priority, high priority, medium priority, and priority connections.

Changes to Subregional Inputs

With the shift to consistent methods and data across most of the SECAS geography, the number of subregional plans stitched together in the Southeast Blueprint decreased from 10 to 3. Only the Caribbean Landscape Conservation Design remained unchanged from Southeast Blueprint 2021. The following subregional inputs did change in Southeast Blueprint 2022:

Changes & Updates to Inputs

Base Blueprint 2022

The new input plan that uses consistent methods and indicators across all 15 Southeast states is referred to as the “Base Blueprint” because it forms the base of the Southeast Blueprint. This plan replaced the South Atlantic Blueprint, Appalachian NatureScape Design, Florida Blueprint, Gulf Hypoxia Blueprint, Middle Southeast Blueprint, North Atlantic Nature’s Network, Oklahoma CHAT,

and Texas CHAT. The Base Blueprint applies a modified version of the 2021 South Atlantic Blueprint approach. For more information on the changes made between South Atlantic Blueprint 2021 and Base Blueprint 2022,.

Florida Marine Blueprint

A new version of the Florida Marine Blueprint (version 2.0) replaced Florida Marine Blueprint 1.0 within the Florida marine environment.

Integration of Overlapping Southeast Blueprint Inputs

Changes to Inputs Used in Specific Overlap Zones

The integration rules and overlap zones used in previous versions of the Southeast Blueprint were no longer needed in 2022. The only overlap between input plans occurred between the Base Blueprint and Florida Marine Blueprint in the nearshore waters around Florida. The Base Blueprint was used anywhere it occurred, and the Florida Marine Blueprint and Caribbean Landscape Conservation Design were used only outside of the Base Blueprint area.

Changes to Input Areas Layer

The input areas layer was updated to reflect the extents of the updated inputs to the Blueprint.

Changes to Connectivity Layer

The Base Blueprint provided a consistent connectivity layer that covered all 15 SECAS states. This layer is referred to as “hubs and corridors” rather than the “hubs and connectors” wording used in previous versions of the Southeast Blueprint, because it is an extension of the previous South Atlantic Blueprint connectivity methodology.

Southeast Blueprint 2021

Version 2021 of the Southeast Blueprint was released in November 2021. At the highest level, significant improvements over the previous versions include:

- Correcting a spatial rebalancing error in the Middle Southeast subregion by using the full Middle Southeast Blueprint 2020 as the input to Southeast Blueprint 2021
- Major improvements to the South Atlantic Blueprint, including:
 - Updated and improved indicators
 - Better incorporation of equity, deep-sea coral, fire, and important grassland areas
 - Multiple connectivity-related improvements

Changes to Subregional Inputs

Florida Blueprint 1.3, Florida Marine Blueprint 1.0, Gulf Hypoxia Precision Conservation Blueprint v1.5, the Appalachian NatureScape Design and The Nature Conservancy's Resilient and Connected Landscapes "Prioritized Network" layer, Nature's Network, the Caribbean Landscape Conservation Design, Oklahoma CHAT, and Texas CHAT remain unchanged from Southeast Blueprint 2020. The following subregional inputs did change in Southeast Blueprint 2021.

Changes & Updates to Inputs

South Atlantic Blueprint 2021

An updated version of the South Atlantic Blueprint was used. This version is named South Atlantic Blueprint 2021. South Atlantic Blueprint uses improved data for many indicators, an improved connectivity approach, more consistent indicator weighting, and a finer spatial resolution in the marine environment.

Middle Southeast Blueprint 2020

The previous Southeast Blueprint used a version of Middle Southeast Blueprint 2020 that was spatially rebalanced within the smaller extent where the Middle Southeast Blueprint was used as an input to the Southeast Blueprint. Unfortunately, an error was made in the spatial rebalancing process. To correct that error in Southeast Blueprint 2021, we used the full (non-rebalanced) [Middle Southeast Blueprint 2020](#) as the input to the Middle Southeast region.

Integration of Overlapping Southeast Blueprint Inputs

Changes to Inputs Used in Specific Overlap Zones

While the integration rules themselves remained the same as those used in Blueprint 2020, the application of those rules resulted in different inputs being used in specific overlap zones.

Plans used in the following overlap zones changed this year due to changes in the extent of the South Atlantic Blueprint:

- A portion of the nearshore environment on the Gulf coast of Florida was included in the 2021 South Atlantic Blueprint for the first time, so South Atlantic Blueprint priorities were used in that area instead of Florida Marine Blueprint priorities.
- A portion of northern Florida near Jacksonville was not included in the South Atlantic Blueprint this year. As a result, this area is no longer an overlap zone, so Florida Blueprint priorities were used alone; the previous version of the Southeast Blueprint used both the Florida Blueprint and South Atlantic Blueprint priorities.

For comparison, plans used in the following overlap zones remained the same this year:

- The zone in MO where the Middle Southeast Blueprint and Gulf Hypoxia Blueprint overlap: both plans continued to be used.
- The zone in VA where the South Atlantic Blueprint and Nature's Network overlap: both plans continued to be used.
- The zone in the Big Bend of FL where the South Atlantic Blueprint and Florida Blueprint overlap: both plans continued to be used.
- The zone in the Big Bend of FL where the South Atlantic Blueprint, Florida Blueprint, and Middle Southeast Blueprint overlap: all three plans continued to be used.

Changes to Input Areas Layer

The input areas layer was updated to reflect the extents of the updated inputs to the Blueprint, as well as the inputs used in the overlap zones.

Changes to Connectivity Layer

The connectivity layer incorporated updated hubs and connectors for the South Atlantic subregion.

Southeast Blueprint 2020

Version 2020 of the Southeast Blueprint was released at the October 2020 SEAFWA virtual annual meeting. At the highest level, significant improvements over the previous versions include:

- Major improvements to the inland area covered by the South Atlantic Blueprint, including finer resolution and a more connected network of priorities.
- Improvements to the area covered by the Middle Southeast Blueprint, including updated data and an approach to overall prioritization that will make comparisons across the Southeast more consistent.
- Better integration in areas where the South Atlantic Blueprint overlaps with the Florida Blueprint and with Nature's Network.

Changes to Subregional Inputs

Florida Blueprint 1.3, Florida Marine Blueprint 1.0, Gulf Hypoxia Precision Conservation Blueprint v1.5, the Appalachian NatureScape Design and The Nature Conservancy's Resilient and Connected Landscapes "Prioritized Network" layer, Nature's Network, the Caribbean Landscape Conservation Design, Oklahoma CHAT, and Texas CHAT remain unchanged from Southeast Blueprint 4.0. The following subregional inputs did change in Southeast Blueprint 2020.

Changes & Updates to Inputs

South Atlantic Blueprint 2020

An updated version of the South Atlantic Blueprint was used. This version is named South Atlantic Blueprint 2020. South Atlantic Blueprint uses a finer spatial resolution, improved modeling approach, and improved data for many indicators.

Middle Southeast Blueprint 2020

An updated version of the Middle Southeast Blueprint was used. Note: This input has been previously been referred to as the Middle South Blueprint and Gulf Coastal Plains & Ozarks (GCPO) Blueprint; the name has now changed to Middle Southeast. The 2020 Middle Southeast Blueprint includes minor improvements to the underlying species index, conservation hubs (partnership focal areas) layer, and risk index; it also prioritizes the species index, habitat index, and conservation hubs more highly in the final Blueprint. The Middle Southeast Blueprint was also spatially rebalanced this year within the smaller extent where the Middle Southeast Blueprint is used as an input.

Integration of Overlapping Southeast Blueprint Inputs

Changes to Inputs Used in Specific Overlap Zones

While the integration rules themselves remained the same as those used in Blueprint 4.0, the application of those rules resulted in different inputs being used in specific overlap zones.

Plans used in the following overlap zones changed this year:

- The zone in KY, TN, and AL where the Middle Southeast Blueprint and Appalachian NatureScape Design overlap: both plans were used this year, while only the Middle Southeast Blueprint was used in the previous version.
- The zone in AL, GA, NC, and SC where the South Atlantic Blueprint and Appalachian NatureScape Design overlap: only the App was used this year, while only the South Atlantic was used last year. Note: this overlap zone is much larger this year because the South Atlantic Blueprint was expanded to cover a larger buffer area.
- The zone in GA and AL where the Middle Southeast Blueprint and South Atlantic Blueprint overlap: both plans were used this year, while only the South Atlantic Blueprint was used in the previous version.
- The zone in the westernmost panhandle of Florida where the Florida Blueprint and Middle Southeast Blueprint overlap: both plans were used this year, while only the Florida Blueprint was used last year.

For comparison, plans used in the following overlap zones remained the same this year:

- The zone in MO where the Middle Southeast Blueprint and Gulf Hypoxia Blueprint overlap: both plans continued to be used.
- The zone in VA where the South Atlantic Blueprint and Nature's Network overlap: both plans continued to be used.
- The zone in the Big Bend of FL where the South Atlantic Blueprint and Florida Blueprint overlap: both plans continued to be used.
- The zone in the Big Bend of FL where the South Atlantic Blueprint, Florida Blueprint, and Middle Southeast Blueprint overlap: all three plans continued to be used.

Changes to Input Areas Layer

The input areas layer was updated to reflect the extents of the updated inputs to the Blueprint, as well as the inputs used in the overlap zones.

Changes to Connectivity Layer

The connectivity layer incorporated updated hubs and connectors for the South Atlantic subregion.

Southeast Blueprint v4.0

Version 4.0 of the Southeast Blueprint was released at the October 2019 SEAFWA annual meeting. At the highest level, significant improvements over the previous versions include: corrected overprioritization in Texas, Oklahoma, and the mountains of West Virginia and Virginia; improved priorities in the Lower Mississippi Valley, Louisiana marshes, and the Southern Appalachians; updated inputs from Florida and the Middle South subregion; expanded marine coverage to include state and federal waters around Florida; and expanded hubs and corridors that now cover all of Florida.

Changes to Subregional Inputs

South Atlantic Blueprint 2.2, Nature's Network, the Caribbean Landscape Conservation Design, and the Oklahoma CHAT remain unchanged from Southeast Blueprint 3.0. The following subregional inputs did change in Blueprint 4.0.

New Inputs Added

Florida Marine Blueprint

A new marine Blueprint for Florida was added as an input. This is the first marine Blueprint for this area, so it is named Florida Marine Blueprint 1.0.

Inputs Removed

The Gulf Coast Prairie (GCP) Blueprint 1.0

The Gulf Coast Prairie Blueprint is no longer used in Version 4.0 of the Southeast Blueprint. With the expansion of the Middle South (former GCPO) Blueprint to cover all of Louisiana, the GCP subregion is entirely captured by other Blueprint inputs. There is currently no process identified to update the GCP Blueprint long-term. The integration rules chosen by the expert teams that reviewed the Texas/Oklahoma and Gulf of Mexico overlap areas chose to exclude the GCP Blueprint and use only the Crucial Habitat Assessment Tool (CHAT) and Middle South Blueprint.

Changes & Updates to Inputs

Florida Blueprint

An updated version of the Florida Blueprint was used. This version is named Florida Blueprint 1.3.

The Appalachian NatureScape Design

We continue to use data from the Phase II Appalachian NatureScape Design. Because NatureScape does not cover enough of the landscape to be consistent with the other inputs, we augment it with

another prioritization. In Blueprint 4.0, we augmented the NatureScape design with The Nature Conservancy's Resilient and Connected Landscapes "Prioritized Network" layer instead of the NatureScape Phase I Species Richness layer that was used in 3.0. This newly available layer does a better job identifying biodiversity hotspots that will be resilient to climate change and, unlike the species richness layer, all the underlying information is also publicly available.

Middle South Blueprint (previously called the Gulf Coastal Plains & Ozarks, or GCPO, Blueprint)

The new Middle South Blueprint is an updated, expanded, and renamed version of the Gulf Coastal Plains and Ozarks (GCPO) Blueprint. It now covers the entire state of Louisiana and has significantly improved priorities in the Lower Mississippi Valley and the marshes of Louisiana.

Gulf Hypoxia Precision Conservation Blueprint v1.5

We continue to use data from the Gulf Hypoxia Precision Conservation Blueprint v1.5 Sum - Conservation and Watershed Interests (2016) layer. In version 3.0 of the Southeast Blueprint, scores of 5-7 were defined as "high", accidentally omitting scores of 8. This error has been corrected in Version 4.0 of the Southeast Blueprint, and high is now defined as scores of 5-8. Medium remains unchanged and is still defined as a score of 4.

The Crucial Habitat Assessment Tool for Texas

We continue to use data from the CHAT to cover both Texas and Oklahoma. While the Oklahoma CHAT input to Southeast Blueprint 4.0 remains unchanged, we changed our approach to spatially rebalancing the Texas CHAT input to the Southeast Blueprint to address issues with overprioritization. In Version 3.0 of the Southeast Blueprint, scores of 1 and 2 on the combined CHAT rank were defined as high, and scores of 3 were defined as medium. This approach continues to work well in Oklahoma, but in Texas, this prioritized too much of the landscape as high (more than the 30% intended). In the Version 4.0 Texas CHAT input, "high" includes CHAT rank 1 and only a subset of CHAT rank 2 with high terrestrial and aquatic scores (aquatic 2 & terrestrial 2, aquatic 2 & terrestrial 3, aquatic 3 & terrestrial 2). "Medium" is defined as the remainder of CHAT rank 2 with lower terrestrial and aquatic scores. CHAT rank 3 is no longer prioritized in the Texas CHAT input to Southeast Blueprint 4.0.

Integration of Overlapping Southeast Blueprint Inputs

Changes to Integration Rules

We use integration rules to define how Blueprint priorities are determined in areas where multiple subregional inputs overlap. Several changes were made to these integration rules in Southeast Blueprint 4.0.

In Southeast Blueprint 3.0, if an area was a priority in any of the inputs, it was included in the final Blueprint. If two inputs disagreed on whether an area should be medium or high value, we used the score from the most mature plan (the input that has been in development the longest) to favor the most well-established plans. This rule resulted in overlap areas that were overprioritized, with much more than 50% of the landscape included in the final Southeast Blueprint. We expect some overlap areas to slightly exceed the 50% target for subregional inputs due to the conservation importance of some of these areas. In some cases, however, more than 90% of the overlap area was prioritized.

To reduce overprioritization and confusion about what drives the Blueprint priorities, we instead only included more than one input in an overlap zone if known Blueprint uses had occurred using the input in that overlap zone. If no known Blueprint uses had occurred for any of the inputs, we included only the most well-established input. Teams of local experts reviewed the spatial results of the integration rules and approved the final approach. These improved methods massively reduced the amount of overprioritization. For example, in the West Virginia and northern Virginia overlap zone, the percentage of the landscape prioritized in the Blueprint decreased from 80% to 55%.

Changes to Inputs Used in Specific Overlap Zones

The new broad integration rules resulted in different plans being used in specific overlap zones. The treatment of overlap zones in Southern Virginia and Southern Missouri are the only overlap zones that did not change in Blueprint 4.0. Southern Virginia still uses both South Atlantic and Nature's Network inputs where those plans overlap.

Similarly, Southern Missouri still uses both the Middle South and Gulf Hypoxia where both plans overlap. However, while continuing to use the Gulf Hypoxia Blueprint across the full state of Missouri in Southeast Blueprint 4.0 does not reflect a change in methodology, this does reflect a change in approach. In Southeast Blueprint 3.0, using the Gulf Hypoxia Blueprint statewide was an error; it was not intended to be used in the overlap zone with the Gulf Coastal Plains and Ozarks Blueprint, but only to fill the gap in northern Missouri not covered by any other inputs. In Blueprint 4.0, the Gulf Hypoxia Blueprint is used statewide because there are use cases for that plan in the overlap zone with the Middle South Blueprint.

The approach to the following overlap zones did change in Southeast Blueprint 4.0:

- The panhandle of Florida now uses only the South Atlantic and Florida Blueprints where those plans overlap. The Middle South Blueprint is no longer used where it overlaps with the Florida Blueprint.
- Eastern Alabama/Southwest Georgia now only uses the South Atlantic Blueprint. The Middle South Blueprint is no longer used where it overlaps with the South Atlantic Blueprint.
- The Louisiana coast now only uses the Middle South Blueprint. Now that the Middle South Blueprint has expanded to cover the entire state of Louisiana, the Gulf Coast Prairie Blueprint is no longer used where it overlaps with the Middle South Blueprint.

- West Virginia and Northern Virginia now only uses the Nature’s Network Blueprint. The Appalachian NatureScape design is no longer used where it overlaps with Nature’s Network.
- Eastern Texas now only uses the Texas CHAT. The Middle South and Gulf Coast Prairie Blueprints are no longer used where they overlap with the Texas CHAT.
- Eastern Oklahoma now only uses the Oklahoma CHAT. The Middle South and Gulf Coast Prairie Blueprints are no longer used where they overlap with the Oklahoma CHAT.

Other Miscellaneous Changes

Because we no longer use a universal integration rule for the CHAT, and instead use different integration rules for Texas and Oklahoma, we no longer include the CHAT for other states when merging together the Southeast Blueprint before it is clipped down to the SECAS geography.

Changes to Connectivity Layer

The connectivity layer for Blueprint 4.0 incorporated new hubs and connectors data from the improved Florida Blueprint 1.3. Because “connectors/connections” was the most commonly used word, rather than “corridors”, this layer was renamed “hubs and connectors” rather than “hubs and corridors”.

Changes to Input Areas Layer

The input areas layer was updated to reflect the extents of the updated inputs to the Blueprint, as well as the improved approaches for dealing with multiple inputs in overlap zones. Since overprioritization is no longer a significant problem in these overlap zones, this layer was renamed simply “input areas” instead of “input and overlap areas”.

We added some new fields in the attribute table to help communicate how inputs were used in creating the Blueprint 4.0. We now have a field named “InputsUsedIn_4_0”, which lists the inputs that were actually used in each area to create Southeast Blueprint 4.0. This is in addition to the “InputExtents” field, which shows the full extent of each input area, but does not reflect whether the input was used in the Southeast Blueprint in that area. In Blueprint 3.0, we had a different field called “SEBlueprintInputAll,” which served both purposes, because the old integration rules used each input wherever it occurred.

In addition, we changed the default display for the input areas layer to show where each subregional input is used in Blueprint 4.0, rather than the full extent of each subregional input. The attributes of this layer can still be used to show the full extent of each subregional input, but that is no longer the primary function of this layer since issues with overprioritization in overlap zones have now been mostly resolved. The input areas layer is now primarily intended to serve as a resource for

determining which of the subregional Blueprint inputs covers a particular area of interest, providing a roadmap for where to look for more detailed information.

We've done our best with the following section, but keep in mind it does not represent an exhaustive list of every single change in every past version of the Blueprint. It contains all the changes we documented and were able to recall. The list is more comprehensive with more recent versions as Blueprint documentation improved over time and staff memories were fresher. In other words, we're almost certainly missing a few things, but this should be pretty close! It's always easier to maintain a thorough record moving forward than it is to try to reconstruct the past.

Southeast Blueprint v3.0

Version 3.0 of the Southeast Blueprint was first introduced at the October 2018 SEAFWA annual meeting, and officially released in February 2019. At the highest level, significant improvements over the previous versions include: full coverage of Texas, integrated threat layers covering the full Southeast, and the addition of a hubs and corridors layer covering part of the region.

Changes to Subregional Inputs

New Inputs Added

The Crucial Habitat Assessment Tool for Texas

The CHAT was expanded to Texas and incorporated into Southeast Blueprint 3.0. This filled in a gap in priorities in Western Texas and ensured complete coverage of all SEAFWA states.

Changes to Complementary Data Layers

Several new complementary data layers were developed and added to the Blueprint data gallery:

- A new layer depicting Blueprint input and overlap areas
- An integrated connectivity layer that combined hubs and corridors for the South Atlantic and Appalachian subregions
- Threats and land use change layers, including solar energy suitability, urban growth, and sea-level rise inundation

Other Miscellaneous Changes

We updated and improved the process of mosaicing together the various Blueprint inputs for better spatial accuracy. This included improving the methods we used to convert vector inputs to rasters and being more deliberate with methods for reprojecting and resampling raster inputs. This results in the Southeast Blueprint more closely aligned with its inputs.

Southeast Blueprint v2.0

Southeast Blueprint 2.0 was presented in October during the 2017 Southeastern Association of Fish and Wildlife Agencies' annual meeting, and officially released in November 2017. At the highest level, significant improvements over version 1.0 include improved consistency across LCC boundaries, improved consistency in climate change response, and improved integration beyond the Southeast.

Changes to Subregional Inputs

New Inputs

The Crucial Habitat Assessment Tool

Southeast Blueprint 2.0 brought in priorities from the Western Association of Fish and Wildlife Agencies' Crucial Habitat Assessment Tool (CHAT) to integrate beyond the Southeast (note: CHAT data for the state of Texas was not yet available for Blueprint 2.0).

Changes & Updates to Inputs

The Appalachian NatureScape Design

Southeast Blueprint 1.0 used the species richness layer from Phase I of NatureScape as the input for the Appalachian subregion. Blueprint 2.0 used the updated Phase II NatureScape design. Because the Phase II design did not cover enough of the landscape to be consistent with the other inputs, we augmented it with the same Phase I species richness layer used in 1.0. The Phase II NatureScape design is a connectivity-driven plan, so this added an important connectivity component to the Southeast Blueprint.

The South Atlantic Blueprint

An updated version of the South Atlantic Blueprint was used. This version was named South Atlantic Blueprint 2.2. This version of the South Atlantic Blueprint incorporated improvements to several indicators and minor refinements to the modeling approach.

Southeast Blueprint v1.0

Southeast Blueprint 1.0 was presented in October during the 2016 Southeastern Association of Fish and Wildlife Agencies' annual meeting in Baton Rouge, Louisiana, and officially released in December 2016. This plan provided the first ever integration of spatial plans developed through the South Atlantic, Appalachian, Gulf Coastal Plains and Ozarks, Gulf Coast Prairie, North Atlantic, Peninsular Florida, and Caribbean LCCs. It also included the spatial plan from the Mississippi River Basin/Gulf Hypoxia Initiative spearheaded by seven LCCs (Appalachian LCC, Eastern Tallgrass Prairie and Big Rivers LCC, Great Plains LCC, Gulf Coast Prairie LCC, Gulf Coastal Plains and Ozarks LCC, Plains and Prairie Potholes LCC, and the Upper Midwest and Great Lakes LCC).