



SOUTH ATLANTIC
CONSERVATION BLUEPRINT

The South Atlantic Blueprint Changelog

What has changed with each version of the South Atlantic 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 South Atlantic Blueprint.

The Evolution of the South Atlantic Blueprint

As a living spatial plan, the Blueprint has evolved over time through an iterative revision process, improving its accuracy, spatial resolution, and utility to conservation professionals. This changelog is intended to capture the changes made to the Blueprint since the first version was released in March 2014.

| | | | | | |
|--|----------------|---------------|---------------|------|------|
| <ul style="list-style-type: none">• Driven by indicator data• 30 m resolution | Blueprint 2020 | | | | |
| <ul style="list-style-type: none">• Driven by indicator data• 200 m resolution | Blueprint 2.0 | Blueprint 2.1 | Blueprint 2.2 | | |
| <ul style="list-style-type: none">• Driven by expert opinion• Coarse subwatershed/ marine lease block scale | Blueprint 1.0 | | | | |
| | 2014 | 2015 | 2016 | 2017 | 2020 |

Blueprint 2020

Blueprint 2020 was released in August 2020. While Blueprint 2020 continued to use Zonation, we made significant changes to the modeling approach for the inland Blueprint. We also used a finer spatial resolution (30 m) and made many indicator improvements.

Changes to the Indicators

Improvements to the Overall Approach

- All terrestrial and freshwater indicators were either run at 30 m or resampled from 200 m to 30 m resolution to enable the finer spatial scale of the 2020 Blueprint. However, the marine indicators (which include estuarine open water) remained at a 200 m resolution since the marine portion of Blueprint 2020 was largely not updated from Blueprint 2.2, just resampled to 30 m to match the inland portion.
- With few exceptions, indicators were spatially decoupled from their ecosystem maps and extended to cover broader areas. This approach allowed each pixel's score to consider any relevant high-scoring indicators, rather than assigning each pixel to one ecosystem and using only the indicators that apply to that ecosystem. Especially in transitional or heavily managed areas, it can be difficult to accurately assign each pixel to a single ecosystem. This new approach is more flexible.
- To better match the improved modeling approach for the 2020 Blueprint, we no longer grouped indicators by ecosystem and instead grouped them into coarser categories: terrestrial, freshwater, and marine.

Summary of Indicator Changes

Table 1. The 25 indicators that drive priority in South Atlantic Blueprint 2020 and their changes from Blueprint 2.2. With the exception of estuarine coastal condition, marine mammals, marine birds, and potential hardbottom condition, all Blueprint 2020 indicators were either run at 30 m or resampled to 30 m, versus the 200 m resolution used in Blueprint 2.2. 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 | Blueprint 2020 Indicator | Status | Changes from Blueprint 2.2 |
|-------------|--------------------------------|--------|---|
| Terrestrial | Pine birds | Δ | Previously named pine & prairie birds; resampled to 30 m |
| | Previously burned pine habitat | Δ | Previously named regularly burned habitat; resampled to 30 m |
| | Forested wetland extent | Δ | Updated to 2016 NLCD; rerun at 30 m |
| | Wetland-vegetation edge | - | New resilient coastal sites indicator (30 m) replaces wetland-vegetation edge |
| | Resilient coastal sites | + | |
| | Marsh extent | Δ | Previously named freshwater marsh extent; expanded to include salt marsh; updated to 2016 NLCD; rerun at 30 m |
| | Freshwater marsh birds | - | Freshwater marsh birds and wetland patch size merged to create new marsh patch size indicator that includes fresh and salt marsh; updated to 2016 NLCD; rerun at 30 m |
| | Wetland patch size | - | |
| | Marsh patch size | + | |
| | Maritime forest extent | Δ | Resampled to 30 m from 100 m intermediate layer |
| | Beach birds | Δ | Resampled to 30 m |
| | Unaltered beach | Δ | Resampled to 30 m |
| | Low road density | - | New intact habitat cores indicator (30 m) replaces low road density |
| | Intact habitat cores | + | |
| | Resilient terrestrial sites | Δ | Previously named resilient biodiversity hotspots; rerun at 30 m |
| | Forested wetland birds | - | Upland hardwood birds and forested wetland birds merged to create new forest birds indicator that covers entire landscape; rerun at 30 m |
| | Upland hardwood birds | - | |
| | Forest birds | + | |
| | Low-urban historic landscapes | Δ | Updated to include improved state-level datasets; rerun at 30 m |
| | Greenways & trails | + | New indicator added (30 m) |

| | | | |
|------------|--------------------------------|---|--|
| | Urban open space | Δ | Extended to all urban areas; updated to 2016 NLCD; updated to 2018 TNC Secured Lands; rerun at 30 m |
| | Forested wetland amphibians | - | Forested wetland amphibians and pine & prairie amphibians merged to create new amphibian & reptile areas indicator that covers entire landscape; rerun at 30 m |
| | Pine & prairie amphibians | - | |
| | Amphibian & reptile areas | + | |
| Freshwater | Riparian buffers | Δ | Updated to 2016 NLCD; applied to the EPA Estimated Floodplain; rerun at 30 m |
| | Permeable surface | Δ | Updated to 2016 NLCD; rerun at 30 m |
| | Imperiled aquatic species | Δ | Applied to EPA Estimated Floodplain; rerun at 30 m |
| | Migratory fish connectivity | Δ | Applied to the EPA Estimated Floodplain; rerun at 30 m |
| | Network complexity | Δ | Applied to the EPA Estimated Floodplain; rerun at 30 m |
| Marine | Estuarine coastal condition | Δ | Previously named coastal condition; limited to open water estuaries only |
| | Marine mammals | o | |
| | Marine birds | o | |
| | Potential hardbottom condition | o | |

Old Indicators Merged

Because we moved away from assigning each indicator to a spatially defined ecosystem, it made sense to merge several indicators in the 2020 Blueprint. These indicators served similar functions, but applied to different ecosystems within the South Atlantic geography. In the 2020 Blueprint, it was no longer necessary to separate them in this way.

- Wetland patch size and freshwater marsh birds were merged into a new indicator called “marsh patch size” that covers all freshwater and saltwater marsh across the South Atlantic geography. Both of these old indicators already measured marsh patch size; the name “freshwater marsh birds” just stemmed from the species-based patch size thresholds used to interpret the indicator values. One indicator simply applied to the estuarine marsh ecosystem and the other to the freshwater marsh ecosystem. Particularly because the NLCD treats both freshwater and saltwater marshes as the same “emergent herbaceous wetlands” class, it made more sense to combine the two now that we’re not assigning each pixel to a defined ecosystem. The source data was updated to 2016 NLCD, and the indicator was rerun at 30 m from updated source data.

- Upland hardwood birds and forested wetlands birds were merged into a “forest birds” indicator that covers all forest habitat across the entire South Atlantic geography. The species-based thresholds used in the old indicators were combined into a larger index, because the bird species use a mix of forested wetland and upland hardwood habitats, and because we were no longer constrained by assigning each pixel to a defined ecosystem. These old indicators used data from two different habitat suitability modeling projects, so we adjusted the index to mostly include habitat considered suitable in either model. This new merged indicator was rerun at 30 m from this updated configuration of the previous source data.
- Forested wetland amphibians and pine and prairie amphibians were merged into a new indicator called “amphibian and reptile areas” that covers all Priority Amphibian and Reptile Conservation Areas (PARCAs) across the entire South Atlantic geography. This avoided splitting contiguous PARCAs into multiple parts across ecosystem boundaries, and allowed the indicator to capture important reptile and amphibian habitat that occurred in the previously defined upland hardwood system. This new indicator was rerun at 30 m from the previous source data and expanded to cover the entire South Atlantic region.

New Indicators Added

- Greenways and trails was added as a new terrestrial indicator. Greenways and trails is a cultural resource indicator that measures both the natural condition and connected length of greenways and trails to characterize the quality of the recreational experience.
- Intact habitat cores was added as a new terrestrial indicator, replacing low road density. Intact habitat cores is derived from better, more recent source data and better captures large patches of unfragmented natural habitat.
- Resilient coastal sites was added as a new terrestrial indicator to capture the climate resilience of tidal marsh complexes, replacing water-vegetation edge. Resilient coastal sites more fully characterizes the diversity and complexity of coastal marshes.

Old Indicators Removed

- Low road density was removed as an indicator, replaced by intact habitat cores (see New Indicators Added section above).
- Water-vegetation edge was removed as an indicator, replaced by resilient coastal sites (see New Indicators Added section above).

Indicators Changed

Terrestrial

- Regularly burned habitat was renamed “previously burned pine habitat” to better reflect what the indicator is actually measuring, and for clarity now that it is categorized as a terrestrial indicator rather than a pine and prairie indicator. It was also resampled to 30 m from the 200 m version used in the previous Blueprint. We could not locate or reproduce the previous source data in the time available.
- Pine and prairie birds was renamed “pine birds” to better reflect where the indicator applies (i.e., essentially the longleaf ecosystem, not other kinds of prairie). It was also resampled to 30 m from the 200 m version used in the previous Blueprint. We could not locate or reproduce the previous source data in the time available.
- Freshwater marsh extent was renamed “marsh extent”. It was extended to cover both freshwater and saltwater marsh. It was updated to 2016 NLCD and rerun at 30 m from updated source data.
- Beach birds was resampled from the 200 m version used in the previous Blueprint. We could not locate or reproduce the previous source data in the time available.
- Unaltered beach was rerun at 30 m from the previous source data.
- Forested wetland extent was updated to the 2016 NLCD and rerun at 30 m from updated source data.
- Maritime forest extent was resampled to 30 m from a 100 m intermediate layer rather than updated directly from the previous source data. We could not locate or reproduce the previous source data in the time available.
- Low-urban historic landscapes was updated to include improved state-level datasets for VA, NC, SC, and FL, and to use only point data (omitting polygons) from the National Register of Historic Places for GA and AL. GIS errors in the national polygon layers overestimated the extent of many historic places. It was rerun at 30 m from updated source data.
- Resilient biodiversity hotspots was renamed “resilient terrestrial sites” to better match The Nature Conservancy's (TNC) naming conventions. It was rerun at 30 m from the previous source data.
- Urban open space was extended to cover all urban areas in the South Atlantic, instead of just urban areas within the upland hardwood ecosystem. It was updated to 2016 NLCD and the 2018 version of TNC's Secured Lands. It was rerun at 30 m from updated source data.

Freshwater

- Riparian buffers was updated to 2016 NLCD and applied to the EPA Estimated Floodplain instead of the Active River Area. It was rerun at 30 m from updated source data.
- Permeable surface was updated to 2016 NLCD and rerun at 30 m from updated source data.
- Network complexity was applied to the EPA Estimated Floodplain instead of the Active River Area. It was rerun at 30 m from previous source data.
- Migratory fish connectivity was applied to the EPA Estimated Floodplain instead of the Active River Area. It was rerun at 30 m from previous source data.
- Imperiled aquatic species was applied to the EPA Estimated Floodplain instead of the Active River Area. It was rerun at 30 m from previous source data.

Marine

- Coastal condition was renamed “estuarine coastal condition” for clarity now that it is categorized as a marine indicator rather than an estuarine indicator. It was clipped to the open water estuaries portion of the marine subregion using the “open water estuaries” class of the ecosystem map used in the previous version of the Blueprint.

Changes to Connectivity

We maintained the same overall Linkage Mapper-based approach to connectivity in Blueprint 2020, with the following changes:

- Blueprint 2020 priorities were used to define the resistance raster and hubs.
- Because LinkageMapper could not successfully complete a corridor run at 30 m, corridors were run at 90 m and then resampled to 30 m. This is still a resolution improvement over the Blueprint 2.2 corridors, which were run at 200 m to match the rest of Blueprint 2.2.

Changes to the Ecosystem Integrity Scores

Inland

While Blueprint 2020 continued to use Zonation to calculate ecosystem integrity scores, we improved the inland modeling approach in the following ways:

- We first removed areas with low conservation value, like most developed areas, as well as reservoirs. This gave Zonation edges to work from as it removed the lowest-value pixels, which resulted in more contiguous cores of priority and fewer isolated speckles. In the previous version of the Blueprint, the only edges Zonation had to work with were the boundaries of each ecosystem as defined by the ecosystem maps. Also in the previous version, we removed all inland waterbodies, not just reservoirs; this year, we attempted to distinguish between manmade reservoirs and naturally occurring waterbodies, and only removed the reservoirs.
- We ran the analysis within subregions, rather than within ecosystems. This reduced computational time and improved the priorities in transition zones between ecosystems.
- All terrestrial and freshwater indicator weights were changed as part of moving to subregional Zonation runs instead of ecosystem-specific Zonation runs, so we will not list all those changes in detail. To summarize, in the previous version of the Blueprint, only two terrestrial indicators received a weight lower than 1: low-urban historic landscapes and urban open space. This reduced overprioritization of these indicators resulting from their rarity/small spatial extent and strong tradeoffs with other indicators. In the 2020 Blueprint, indicator weights were adjusted much more frequently--still with the goal of trying to ensure spatially limited indicators were not all prioritized, as well as limiting the influence of outdated indicator data and prioritizing indicators consistently across different subregions.
- The ecosystem integrity scores (and therefore the final Blueprint) had a finer 30 m resolution due to using finer resolution indicators.

Marine

- The marine portion of the previous Blueprint (which includes open water estuaries) was simply resampled to 30 m to match the resolution of the inland portion of the 2020 Blueprint. Otherwise, the marine portion of the 2020 Blueprint is the same as in Blueprint 2.2.

Changes to the Final Blueprint Priorities

- In the previous version of the Blueprint, inland waterbodies were assigned to their own class in the Blueprint in an effort to communicate that they were not prioritized. In Blueprint 2020, we removed only manmade reservoirs rather than removing all inland waterbodies. We assigned reservoirs to the “not a priority for shared action” class, rather than creating a separate reservoir class. We learned from the previous version that the “inland waterbodies” class had not been interpreted in the way we intended. Instead of indicating that inland waterbodies were not prioritized at all, the separate class appeared to give the impression that inland waterbodies were a special priority class.

We've done our best with the following section, but 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 for more recent versions because the quality of Blueprint documentation has improved over time, and staff memories were fresher for more recent changes. 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.

Blueprint 2.2

Blueprint 2.2 was released in November 2017. It used the same overall approach and maintained the same 200 m spatial scale as Blueprint 2.1 and 2.0, with some improvements.

Changes to the Indicators

Improvements to the Overall Approach

- The ecosystem extent indicators were reimagined to reflect the current extent of a particular ecosystem, and ecosystem maps were reimagined to reflect potential restorable extent. This allowed the ecosystem extent indicators to be used in Zonation for the first time. Previously, ecosystem extent indicators had matched the ecosystem maps, and so were not used in Zonation because they did not provide any new information not already provided by the ecosystem map defining the boundaries of the model run.

Summary of Indicator Changes

Table 2. The 27 indicators that drive priority in South Atlantic Blueprint 2.2 and their changes from Blueprint 2.1. 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

| Ecosystem | Blueprint 2.2 Indicator | Status | Changes from Blueprint 2.1 |
|----------------------|--------------------------------|--------|---|
| Beach & dune | Beach birds | Δ | Rescaled from 0-100 for consistency with other continuous indicators |
| | Unaltered beach | Δ | Updated to incorporate more recent data on undeveloped beaches |
| Estuarine open water | Coastal condition | o | |
| Estuarine marsh | Water-vegetation edge | o | |
| | Wetland patch size | o | |
| Forested wetland | Forested wetland extent | Δ | Recomputed to capture only the current extent of forested wetland |
| | Forested wetland amphibians | o | |
| | Forested wetland birds | o | |
| Freshwater aquatic | Imperiled aquatic species | o | |
| | Permeable surface | o | |
| | Riparian buffers | o | |
| Freshwater marsh | Freshwater marsh extent | Δ | Recomputed to capture only the current extent of freshwater marsh |
| | Freshwater marsh birds | o | |
| Marine | Marine birds | + | With the addition of the new marine birds indicator, marine depth zones (though not truly an indicator) were no longer needed to stratify marine priorities |
| | Marine depth zones | - | |
| | Marine mammals | o | |
| | Potential hardbottom condition | o | |
| Maritime forest | Maritime forest extent | Δ | Recomputed to capture only the current extent of maritime forest |

| | | | |
|-----------------|---------------------------------|---|---|
| Pine & prairie | Pine & prairie amphibians | o | |
| | Pine & prairie birds | o | |
| | Regularly burned habitat | o | |
| Upland hardwood | Upland hardwood birds | o | |
| | Urban open space | o | |
| Landscapes | Resilient biodiversity hotspots | Δ | Updated to incorporate more recent data from TNC's Resilient Land project |
| | Low road density | o | |
| | Low-urban historic landscapes | o | |
| Waterscapes | Migratory fish connectivity | o | |
| | Network complexity | o | |

New Indicators Added

- Marine birds was added as a new indicator. This indicator captured highly productive areas for birds that feed mainly or exclusively at sea. It helped identify key areas of ocean productivity and complemented the marine mammal index by providing finer spatial resolution and stronger connections to forage fish productivity.

Old Indicators Removed

- Marine depth zones were no longer used to stratify priorities in the marine environment in Blueprint 2.2. It was not necessary after the introduction of marine birds, which naturally helped distribute priorities across depth zones. (While marine depth zones are not strictly an indicator, they did function in a similar way in the modeling process in previous Blueprints.)

Indicators Changed

Beach & Dune

- Beach and dune birds was rescaled from 0-100 for consistency with other continuous indicators. In 2.1 and 2.0, the indicator was scaled from 0-10.
- Unaltered beach was updated to incorporate more recent data from the Coastal Barrier Resources System, which is used to set the boundaries of undeveloped beaches. This part of the indicator was also expanded to apply to new pixels added to the ecosystem map in Blueprint 2.1, though no developed structures were added to those pixels.

Forested Wetland

- Forested wetland extent was recomputed using NLCD data to capture only the current extent of forested wetland. This distinguished it from it from the forested wetland ecosystem map, which was reinvisioned to reflect potential restorable forested wetland. Essentially, this reverted the indicator back to its Blueprint 2.0 state, but with an improved resampling method.

Freshwater Marsh

- Freshwater marsh extent was recomputed using NLCD data to capture only the current extent of freshwater marsh. This distinguished it from it from the freshwater marsh ecosystem map, which was reinvisioned to reflect potential restorable freshwater marsh. Essentially, this reverted the indicator back to its Blueprint 2.0 state, but with an improved resampling method.

Landscapes

- Resilient biodiversity hotspots was updated to incorporate more recent data from TNC's Resilient Land project.

Maritime Forest

- Maritime forest extent was recomputed using a combination of NLCD and state-specific data to capture only the current extent of maritime forest. This distinguished it from it from the maritime forest ecosystem map, which was reinvisioned to reflect potential restorable maritime forest. Essentially, this reverted the indicator back to its Blueprint 2.0 state, but with an improved resampling method.

Changes to Connectivity

- Blueprint 2.2 priorities were used to define the resistance raster and hubs.
- The Gap status “unknown” class of protected areas was added as an eligible hub.

Changes to the Ecosystem Integrity Scores

Improvements to the Overall Approach

- All landscapes, waterscapes, and freshwater aquatic indicators were used to calculate ecosystem scores for all ecosystems, instead of just a subset.
- Warp 10 was used for all Zonation runs. This reduced computational time and helped make results more reproducible.

Pine & Prairie

- The weight of the low-urban historic landscapes indicator was reduced to 0.075 in this ecosystem, from 0.25 in Blueprint 2.1.

Maritime Forest

- Blueprint 2.2 included more indicators, using maritime forest extent, all freshwater aquatic, all landscapes, and all waterscapes indicators, instead of just low road density, low-urban historic landscapes, and permeable surface.
- Instead of warp 1, Blueprint 2.2 used warp 10 for this ecosystem to reduce computational time and generate more reproducible results.

Marine

- Instead of warp 1000, Blueprint 2.2 used warp 10 for this ecosystem.
- Marine depth zones were no longer used as an input to stratify the Zonation results, as the new marine birds indicator made them unnecessary.

Freshwater Marsh

- The weight of the low-urban historic landscapes indicator was reduced to 0.5 in this ecosystem, from 1 in Blueprint 2.1.
- Blueprint 2.2 included an additional indicator, freshwater marsh extent.
- Instead of warp 1, Blueprint 2.2 used warp 10 for this ecosystem to reduce computational time and generate more reproducible results.

Forested Wetland

- The weight of the low-urban historic landscapes indicator was reduced to 0.05 in this ecosystem, from 0.1 in Blueprint 2.1.
- Blueprint 2.2 included an additional indicator, forested wetland extent.

Estuarine Marsh

- Instead of warp 1, Blueprint 2.2 used warp 10 for this ecosystem to reduce computational time and generate more reproducible results.

Beach & Dune

- Instead of warp 1, Blueprint 2.2 used warp 10 for this ecosystem to reduce computational time and generate more reproducible results.

Changes to the Final Blueprint Priorities

- Inland waterbodies were no longer prioritized. In previous Blueprints, the priority of waterbodies was based on the priority of the surrounding pixels, which was causing problems in the Blueprint. We created a separate “inland waterbodies” class in the final Blueprint data layer in an effort to communicate that they were not prioritized.

Blueprint 2.1

Blueprint 2.1 was released in August 2016. It used the same overall approach and maintained the same 200 m spatial scale as Blueprint 2.0, with some improvements.

Changes to the Indicators

Summary of Indicator Changes

Table 3. The 27 indicators that drive priority in South Atlantic Blueprint 2.1 and their changes from Blueprint 2.0. 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

| Ecosystem | Blueprint 2.1 Indicator | Status | Changes from Blueprint 2.1 |
|--------------------|-----------------------------|--------|--|
| Beach & dune | Beach birds | o | |
| | Unaltered beach | o | |
| Estuarine | Coastal condition | Δ | Updated to incorporate 2010 sampling data; expanded to fill in new areas of ecosystem map |
| Estuarine marsh | Water-vegetation edge | o | |
| | Wetland patch size | o | |
| Forested wetland | Forested wetland amphibians | Δ | Expanded to fill in new areas of ecosystem map |
| | Forested wetland birds | Δ | Updated to include entire ACF Basin; used improved resampling method; expanded to fill in new areas of ecosystem map |
| | Forested wetland extent | Δ | Expanded to match ecosystem map |
| Freshwater aquatic | Imperiled aquatic species | + | New indicator added |
| | Permeable surface | Δ | Made continuous instead of binned; used improved resampling method |
| | Riparian buffers | Δ | Applied to the Active River Area; made continuous instead of binned; recalculated based on NLCD and NHD+ |

| | | | |
|------------------|----------------------------------|---|--|
| | | | catchments; no longer summarized by HUC12 |
| Freshwater marsh | Freshwater marsh birds | Δ | Made continuous instead of binned; used improved resampling method; expanded to fill in new areas of ecosystem map |
| | Freshwater marsh extent | Δ | Expanded to match ecosystem map |
| Marine | Marine mammals | + | New marine mammals indicator replaced marine turtles & mammals |
| | Marine turtles & mammals | - | |
| | Primary productivity | - | Removed, not performing well as an indicator |
| | Potential hardbottom condition | o | |
| Maritime forest | Maritime forest extent | Δ | Expanded to match ecosystem map |
| Pine & prairie | Pine & prairie amphibians | Δ | Expanded to fill in new areas of ecosystem map |
| | Pine & prairie birds | Δ | Expanded bobwhite and RCW data to fill in new areas of ecosystem map |
| | Regularly burned habitat | o | |
| Upland hardwood | Upland hardwood birds | o | |
| | Urban open space | Δ | Recomputed to emphasize undeveloped areas far from existing protected lands; clipped to 2010 census-designated urban area; used improved resampling method |
| Landscapes | Low road density | Δ | Used improved resampling method |
| | Low-urban historic landscapes | Δ | Added new class for urban historic places; used improved resampling method |
| | Resilient biodiversity hotspots | Δ | Recomputed with 8 classes based on standard deviations from the mean; used an improved resampling method |
| Waterscapes | Migratory fish connectivity | + | New migratory fish connectivity indicator replaced fresh and saltwater connectivity |
| | Fresh and saltwater connectivity | - | |
| | Network complexity | + | New network complexity indicator replaced resident fish connectivity |
| | Resident fish connectivity | - | |

New Indicators Added

- A new imperiled aquatic species indicator was added to capture areas important for aquatic rare species diversity.
- A new marine mammals indicator replaced marine turtles and mammals. The new marine mammals indicator was based on superior data.
- A new migratory fish connectivity indicator replaced fresh and saltwater connectivity. Fresh and saltwater connectivity was not performing well as an indicator and could not be used in Blueprint 2.0.
- A new network complexity indicator replaced resident fish connectivity. Resident fish connectivity was not performing well as an indicator and could not be used in Blueprint 2.0.

Old Indicators Removed

- Primary productivity was removed as a marine indicator. The satellite imagery sometimes conflated sediment with productivity and could not reliably distinguish beneficial levels of productivity from too-high levels resulting from nutrient runoff.
- Marine turtles and mammals was removed as a marine indicator and replaced with marine mammals (see New Indicators Added section above).
- Resident fish connectivity was removed as a waterscapes indicator and replaced with network complexity (see New Indicators Added section above).
- Fresh and saltwater connectivity was removed as a waterscapes indicator and replaced with migratory fish connectivity (see New Indicators Added section above).

Indicators Changed

Estuarine

- Coastal condition was updated to incorporate more recent sampling data from 2010 and to fill in new areas of the estuarine ecosystem map.

Forested Wetland

- Forested wetland birds was expanded in Blueprint 2.1. In Blueprint 2.0, it did not cover the lower half of the ACF Basin because the SERAP bird models used in the indicator did not include that area. In 2.1, the rest of the ACF Basin was filled in using Southeast GAP species models. The indicator was expanded to fill in new areas of the forested wetland ecosystem map using the SERAP bird models. It also used an improved resampling method.
- Forested wetland extent was expanded using Landfire Biophysical Settings data to match the ecosystem map.

- Forested wetland amphibians was expanded to fill in new areas of the forested wetland ecosystem map.

Freshwater Aquatic

- Permeable surface was made continuous instead of binned into categories. It also used an improved resampling method.
- Riparian buffers was totally recomputed in Blueprint 2.1. In Blueprint 2.0, this indicator used data from SARP which defined riparian buffers as areas 30 m on either side of blue-line streams. This method worked poorly for wide coastal rivers. The indicator was also summarized at a HUC 12 level. In Blueprint 2.1, percent natural landcover by catchment was recalculated with similar methods to those SARP used, based on NLCD and NHD+ catchments. However, riparian buffers were defined using the Active River Area. The indicator was no longer summarized by HUC12 and was made continuous instead of being binned into categories.

Freshwater Marsh

- Freshwater marsh extent was expanded using Landfire Biophysical Settings data to match the ecosystem map.
- Freshwater marsh birds was made continuous based on patch size rather than binned into categories based on species thresholds, and expanded to fill in new areas of the freshwater marsh ecosystem map. It also used an improved resampling method.

Landscapes

- Resilient biodiversity hotspots was split into 8 classes based on standard deviations from the mean, rather than the two classes used in Blueprint 2.0. It also used an improved resampling method.
- Low-urban historic landscapes was recalculated with an additional class to give urban historic places a higher score than non-historic places. It also used an improved resampling method.
- Low road density used an improved resampling method.

Maritime Forest

- Maritime forest extent was expanded using Landfire Biophysical Settings data to match the ecosystem map.

Pine & Prairie

- Pine and prairie birds was expanded using Landfire Biophysical Settings data to fill in new areas of the ecosystem map, only for Northern bobwhite and red-cockaded woodpecker. Bachman's sparrow data could not be expanded.
- Pine and prairie amphibians was expanded to fill in new areas of the ecosystem map.

Upland Hardwood

- Urban open space was totally recomputed in Blueprint 2.1. In Blueprint 2.0, the indicator emphasized undeveloped areas close to urban for their positive effect on property values. In Blueprint 2.1, the indicator instead emphasized undeveloped areas far from existing protected lands where new open space would benefit underserved communities. It was also clipped to the 2010 census-designated urban area and used an improved resampling method.

Changes to the Ecosystem Map

- Maritime forest, beach and dune, estuarine, forested wetland, freshwater marsh, pine and prairie, and upland hardwood ecosystem maps were expand using Landfire Biophysical Settings data to fill in areas not assigned to an ecosystem in Blueprint 2.0 (classified in Blueprint 2.0 as "other").

Changes to Connectivity

- In Blueprint 2.1, multiple marine hubs were used rather than the one single linear hub used in Blueprint 2.0.
- The bottom 5% of corridors (based on cost-weighted distance) were removed by handd in Blueprint 2.0. This was not done in Blueprint 2.1.
- Blueprint 2.1 priorities were used to define the resistance raster and hubs.
- Changes were potentially made in the resistance raster related to how urban areas were handled.
- Changes may have been made to the LinkageMapper settings used in the previous Blueprint.

Changes to the Ecosystem Integrity Scores

Improvements to the Overall Approach

- Instead of doing a separate freshwater aquatic ecosystem run, Blueprint 2.1 included freshwater aquatic indicators in the Zonation runs for individual ecosystems, like the landscapes indicators.

- Waterscapes indicators were used as inputs to Zonation for the first time.
- It was no longer necessary to use run stability thresholds to choose final Zonation runs. Moving to more continuous indicators decreased the number of ties Zonation encountered when choosing which pixel to remove. In addition, we used a different approach for NoData pixels that helped reduce this issue.
- Zonation patch aggregation methods changed. Blueprint 2.0 did not use patch aggregation for all ecosystems, and used a mix of the boundary length penalty and edge removal algorithm. Instead, Blueprint 2.1 used edge removal for all ecosystems and did not use boundary length penalty at all.
- Indicator weights were introduced in Blueprint 2.1 to correct for the disproportionate impact of a few rare indicators on the prioritization.

Upland Hardwood

- Many Zonation settings changed in the Blueprint 2.1 upland hardwood run.
 - While Blueprint 2.0 used edge removal and a boundary length penalty of 0.5, Blueprint 2.1 just used edge removal.
 - Instead of warp 1, Blueprint 2.1 used warp 10 for this ecosystem to reduce computational time and generate more reproducible results.
 - Blueprint 2.1 included more indicators, using all upland hardwood, freshwater aquatic, landscapes, and waterscapes indicators, instead of just the upland hardwood and landscapes indicators.
 - Blueprint 2.1 used weights of .5 for urban open space and .1 for low-urban historic landscapes, whereas in Blueprint 2.0 all indicators were weighted equally at 1.

Pine & Prairie

- Many Zonation settings changed in the Blueprint 2.1 pine and prairie run.
 - While Blueprint 2.0 used edge removal and a boundary length penalty of 0.2, Blueprint 2.1 just used edge removal.
 - Blueprint 2.1 included more indicators, using all pine and prairie, freshwater aquatic, landscapes, and waterscapes indicators, instead of just the pine and prairie and landscapes indicators.
 - Blueprint 2.1 used a weight of 0.25 for low-urban historic landscapes, whereas in Blueprint 2.0 all indicators were weighted equally at 1.

Maritime Forest

- Many Zonation settings changed in the Blueprint 2.1 maritime forest run.
 - While Blueprint 2.0 used a boundary length penalty of 0.8, Blueprint 2.1 used edge removal.

- Blueprint 2.1 included different indicators, using permeable surface but not including resilient biodiversity hotspots.
- Blueprint 2.1 used a weight of 0.25 for low-urban historic landscapes, whereas in Blueprint 2.0 all indicators were weighted equally at 1.

Marine

- Many Zonation settings changed in the Blueprint 2.1 marine run.
 - While Blueprint 2.0 used edge removal and a boundary length penalty of 1, Blueprint 2.1 just used edge removal.
 - Blueprint 2.1 used a weight of 0.1 for potential hardbottom condition and 0.1 for the marine depth zones, whereas in Blueprint 2.0 all indicators and depth zones were weighted equally at 1.
 - Instead of warp 1, Blueprint 2.1 ran marine at warp 1000.

Freshwater Marsh

- A couple of Zonation settings changed in the Blueprint 2.1 freshwater marsh run.
 - While Blueprint 2.0 did not use any patch aggregation methods, Blueprint 2.1 used edge removal.
 - Blueprint 2.1 included more indicators, using freshwater marsh birds, all freshwater aquatic, all landscapes, and all waterscapes indicators, instead of just freshwater marsh birds and the landscapes indicators.

Freshwater Aquatic

- Freshwater aquatic was no longer treated like a separate ecosystem with its own Zonation run. In Blueprint 2.0, freshwater aquatic ecosystem scores were computed separately using special methods—using the additive benefits algorithm, stratified by HUC 12, and excluding coastal HUCs. In Blueprint 2.1, they were included in Zonation runs for individual ecosystems like landscapes indicators.

Forested Wetland

- Many Zonation settings changed in the Blueprint 2.1 forested wetland run.
 - Instead of warp 1, Blueprint 2.1 used warp 10 for this ecosystem to reduce computational time and generate more reproducible results.
 - Blueprint 2.1 included more indicators, using forested wetland birds, forested wetland amphibians, all freshwater aquatic, all landscapes, and all waterscapes indicators. In Blueprint 2.0, the forested wetland run included only forested wetland birds, forested wetland amphibians, and all landscapes indicators.

- Blueprint 2.1 used a weight of 0.25 for low-urban historic landscapes, whereas in Blueprint 2.0 all indicators were weighted equally at 1.

Estuarine Open Water

- Though the integrity of the open water portion of estuaries was still only based on one indicator (the coastal condition index), the approach for prioritizing estuarine open water was different in Blueprint 2.1. Instead of using scores of 4.0 and above (classified as “good”) to define the highest priority areas as was done in Blueprint 2.0, the continuous spread of the coastal condition index was divided into 100 equal area classes, allowing it to be used in the same way as a Zonation output.

Estuarine Marsh

- A couple of Zonation settings changed in the Blueprint 2.1 freshwater marsh run.
 - While Blueprint 2.0 used a boundary length penalty of 0.6, Blueprint 2.1 used edge removal.
 - Blueprint 2.1 included more indicators, using all estuarine indicators, all freshwater aquatic indicators, all waterscapes indicators, and low road density and low-urban historic landscapes. Blueprint 2.0 just used the estuarine indicators, low road density, and low-urban historic landscapes.

Beach & Dune

- One Zonation setting changed in the Blueprint 2.1 beach and dune run.
 - While Blueprint 2.0 did not use any patch aggregation methods, Blueprint 2.1 used edge removal.

Blueprint 2.0

Blueprint 2.0 was released in June 2015. It used a totally a different methodology and spatial scale.

Changes

- Instead of an expert-driven process, Blueprint 2.0 used a data-driven process.
 - Blueprint 2.0 used Zonation to prioritize areas of highest ecosystem integrity based on the condition of the indicators.
 - It used Linkage Mapper to create corridors that connected hubs in a least-cost path analysis optimized for shortest distance and indicator condition.
- The resolution improved from terrestrial HUC-12 subwatersheds and marine outer continental shelf lease blocks to a seamless 200 m raster.

Blueprint 1.0

This was the first version of the Blueprint, so no changes yet!

Blueprint 1.0 was released in March 2014. It was an expert-driven plan developed through a series of workshops. It had a coarse spatial scale, prioritizing HUC-12 subwatersheds in the terrestrial environment and outer continental shelf lease blocks in the marine environment. This first Blueprint served as a starting point to learn about the plan's usefulness in conservation decision-making and collect feedback on priority improvements. The changes made during subsequent revisions are reflected throughout this document.