

# CHAPTER 5: Summary and Update of Pilot Project Results

Section 3(c)(4) of the 2006 CBRRA requires that this final report contain a summary and update of the findings of the initial pilot project report required under Section 6(d) of the 2000 CBRRA. This chapter summarizes the results of the pilot project and the extent to which the boundary lines on the digital maps differ from the boundary lines on the original maps by describing the: (1) types of changes to the CBRS boundaries on the pilot project maps; (2) changes to the pilot project maps that do not affect the CBRS boundaries; and (3) final recommended acreage, shoreline, and structure changes. The final recommended pilot project maps and summaries of change for each unit (including acreage, shoreline, and structure changes for each unit) are provided in Appendix C. The acreage, shoreline, and structure change numbers for each pilot project unit are also provided in Appendix D.

The Service found through the course of the pilot project that several of the CBRS mapping protocols needed to be updated and/or clarified. Chapter 4 contains information about the changes to the mapping protocols. The Service also learned a number of lessons through the pilot project about assessing modifications to the CBRS and has developed a set of guiding principles and criteria to be applied to future mapping projects. These guiding principles and criteria are described in Chapter 6.

## Types of Changes to CBRS Boundaries on Pilot Project Maps

### *Modifications to Reflect Geomorphic Change*

The CBRA requires that every five years the Service makes modifications to the boundaries of CBRS units solely to reflect changes caused by natural forces such as

accretion and erosion.<sup>1</sup> The pilot project units underwent this five-year review assessment between 2014 and 2016 through the digital conversion effort; therefore, most geomorphic changes depicted on the proposed maps included in the 2008 pilot project report have been incorporated into the existing boundaries on the final recommended maps contained in this report.<sup>2</sup> The final recommended boundaries incorporate any additional geomorphic changes that have occurred following the assessment that was conducted through the digital conversion effort. For more information on digital conversion, see Chapter 2.

### *Alignment with Geomorphic Features*

CBRS boundaries are often intended to follow geomorphic features such as a shoreline or the interface between wetlands and fastlands. This applies mostly to System Units, though there are many cases where OPA boundaries follow geomorphic features. The boundaries of pilot project System Units and OPAs were modified where appropriate to align with underlying geomorphic features.

### *Alignment with Development Features*

CBRS boundaries are often intended to follow development features (e.g., the edge of a road, a bridge, or the “break-in-development”) that existed on-the-ground when the area was included within the CBRS. The break-in-development is where development ended, immediately adjacent to the last structure in a cluster or row of structures, or at the property parcel boundary of the last structure.<sup>3</sup> This applies mostly to System Units, though there are cases where OPA boundaries follow development features. The boundaries of pilot project System

Units and OPAs were modified where appropriate to align with development features.

### *Alignment with Cultural Features*

CBRS boundaries are often intended to follow cultural features such as political boundaries or conservation/recreation area boundaries. Both System Units and OPAs follow cultural features; however, this applies especially to OPAs, which generally coincide with the boundaries of the underlying conservation and/or recreation areas (although there are several exceptions – see Issue 11 in Chapter 4 for additional information). The boundaries of pilot project System Units and OPAs were modified where appropriate to align with cultural features.

### *Additions to the CBRS*

In carrying out the pilot project, the Service found areas of undeveloped fastland<sup>4</sup> and associated aquatic habitat<sup>5</sup> that are not currently within the CBRS, but are appropriate for inclusion within the CBRS (either as additions to existing units or as entirely new units).

Such additions to the CBRS are consistent with: (1) Section 4(c)(3) (D) of the 2006 CBRRA,<sup>6</sup> which directs the Secretary to make recommendations for the expansion of the CBRS when carrying out digital mapping for the remainder of the CBRS and (2) maps adopted by Congress since 1990 that have expanded the boundaries of CBRS units (e.g., FL-95P, FL-70, FL-70P, P16, P16P, and SC-03) to include qualifying undeveloped areas that were not originally included within the CBRS.<sup>7</sup>

In preparing the proposed pilot project maps included in the 2008 report, the Service was not as robust in its proposals for additions

to the CBRS as it may be in future comprehensive remapping projects (including the Hurricane Sandy project described in Chapter 2). Instead, the Service mainly looked for areas immediately adjacent to the existing CBRS units because, in part, it was not until the 2006 CBRRA that Congress specifically directed the Secretary to recommend additions to the CBRS. In preparing the final recommended maps for the pilot project, the Service found additional areas where qualifying undeveloped fastland and associated aquatic habitat could have been proposed for addition on the maps included in the 2008 report but were not. However, the Service determined that it would not be appropriate to recommend significant new areas for addition to the CBRS without the opportunity for public review, except for a few cases where the new additions are primarily associated aquatic habitat and do not affect any private structures. These areas are noted in the unit summaries in Appendix C. See Chapter 6 for additional information about the Service's guiding principles and criteria for future additions to the CBRS.

- **Additions to System Units**  
The boundaries of pilot project System Units were modified where appropriate to add undeveloped fastland and associated aquatic habitat to the CBRS. Additionally, four new System Units are recommended through the pilot project. All four of the new System Units (Units DE-07, NC-06, FL-01, and FL-93) are comprised of a combination of areas that are reclassified from OPAs and areas not currently within the CBRS. The recommended new units contain undeveloped fastland and associated aquatic habitat that is appropriate for inclusion within the CBRS.

The 2000 CBRRA codified the development criteria (density of development and existing infrastructure)<sup>8</sup> that the Secretary is required to consider when making recommendations to the Congress regarding the addition of any area

to the CBRS and in determining whether, at the time of inclusion of a System Unit within the CBRS, a coastal barrier is undeveloped. During the preparation of the final recommended maps for the pilot project, the Service reviewed the level of development in the areas recommended for addition by visually analyzing the updated base map imagery and oblique aerial photos, reviewing property parcel records as necessary, and reviewing any development information provided by interested parties during the public comment period. The Service is not aware of any existing private residential structures located on lands that are recommended for addition to the pilot project System Units. The final recommended maps are based upon the best data available to the Service at the time the maps were prepared.

- **Additions to OPAs**  
The boundaries of pilot project OPAs were modified where appropriate to add conservation and/or recreation areas to the CBRS. When the Service found conservation/recreation areas that are adjacent to existing pilot project units and that meet the CBRA definition of an OPA<sup>9</sup> but are not currently within the CBRS, the appropriate stakeholders were generally asked to review and concur with the placement of the underlying conservation/recreation area boundary on a base map. This outreach process ensures that the Service has the best available data with which to make changes to the OPA boundaries. Additionally, five new OPAs are recommended through the pilot project. Two of the new OPAs (Units P08P and P11P) are comprised of areas that are reclassified from System Units; two of the new OPAs (Units NC-01P and P09AP) are comprised of a combination of areas that are reclassified from a System Unit and areas not currently within the CBRS; and one of the new OPAs (Unit FL-67P) is comprised entirely of areas not currently within the CBRS.

### *Unit Type Reclassifications*

In carrying out the pilot project, the Service noted cases where areas held for conservation and/or recreation are located within System Units, as well as cases where privately held areas (that are not inholdings) are located within OPAs. When the Service comprehensively remapped the CBRS units in the pilot project, the conservation/recreation areas within the unit were identified and the history of those areas was evaluated to determine whether they were appropriately classified as System Unit or OPA. The Service's remapping protocol at the time of the pilot project generally recommended reclassification from System Unit to an OPA, or vice versa, depending on when the particular area was included within the CBRS and whether the area was held for conservation/recreation at the time it was included.<sup>10</sup> An exception was made for certain conservation/recreation areas where the owner/manager specifically requested that their area be included within the CBRS as a System Unit or for certain privately owned conservation/recreation areas that were intentionally added to the CBRS as System Units through maps adopted by Congress in the past.<sup>11</sup> Another exception was made for minor portions of land and open water in cases where it was impractical from a mapping perspective to delineate them separately as System Unit or OPA (e.g., small islands or other features that are too small to carve out from the surrounding aquatic habitat).

If the Service found no evidence that an area within an existing OPA was held for conservation or recreation at the time it was originally included within the CBRS, then the area in question was generally recommended for reclassification from OPA to System Unit as long as it met the CBRA criteria for an undeveloped coastal barrier at the time it was included within the CBRS. The reclassified areas were either added to an existing adjacent unit (e.g., portions of Unit FL-73P became part of Unit FL-78) or were given a new unit number (e.g.,

portions of Unit DE-07P were reclassified to new Unit DE-07).

Lessons learned through the course of the pilot project and other comprehensive remapping projects resulted in a revision to the Service's protocol regarding System Unit versus OPA classification for future mapping projects. See Issue 11 in Chapter 4 for more information about reclassifications and changes to the Service's OPA mapping protocols and Chapter 6 for additional information about the Service's guiding principles and criteria for future mapping.

### **Removals from the CBRS**

In carrying out the pilot project, the Service found properties that were inappropriately included within the CBRS and are appropriate for removal.

- **Removals from System Units**  
The boundaries of pilot project System Units were modified where appropriate to remove private lands that were included within the CBRS in error. To determine whether an area was appropriate for removal from a System Unit, the Service assessed, as necessary, whether the System Unit boundary followed the underlying feature(s) it was intended to follow; the density of development on-the-ground at the time the area was included within the CBRS; and, in limited cases, the level of infrastructure that was on-the-ground when the area was included within the CBRS. In the pilot project the Service proactively sought historical infrastructure information (e.g., the date of installation of electrical infrastructure from the local electrical utility company and information regarding road construction from the local government) for certain areas within Unit L06 to help determine whether those particular areas are appropriate for removal from the CBRS and to help determine the feasibility of obtaining such information for future comprehensive remapping projects. The Service

also reviewed and considered any infrastructure information for pilot project units that was submitted by interested parties during the public comment period. Proactively obtaining the necessary historical infrastructure documentation is burdensome and resource intensive for the Service. Therefore, for future comprehensive mapping projects, the Service will generally rely on property owners and other interested parties who seek removals to provide the historical documentation necessary to substantiate their infrastructure claim (see Chapter 6 for additional information on the infrastructure review process).

- **Removals from OPAs**  
The boundaries of pilot project OPAs were modified where appropriate to remove private lands that were included within the CBRS in error. The private lands that are recommended for removal are for the most part relatively minor in size, are not inholdings, were not held for conservation or recreation at the time of inclusion, and were likely included within the OPA inadvertently due to the imprecise nature of the 1990s era

CBRS maps (see Figure 26). In cases where a significant portion of private land was included within the existing OPA and met the CBRA criteria for an undeveloped coastal barrier at the time it was included within the CBRS it was reclassified to a System Unit (see Figure 27). See "Unit Type Reclassifications" section above for additional information on reclassifications.

See Chapter 6 for additional information about the Service's guiding principles and criteria for future removals from the CBRS.

### **Modifications to Map CBRS Boundaries in Channels Using a Consistent Protocol**

Channels are often located between coastal barriers and the mainland and are a part of the barrier's associated aquatic habitat.<sup>12</sup> In 1982 and 1988, the Department published guidance for delineating CBRS boundaries located along channels and other water bodies.<sup>13</sup> In carrying out the pilot project, the Service noted that this guidance has not been consistently applied to the CBRS maps created in the past. CBRS boundaries generally follow the center of the channel, but in some cases include all channels

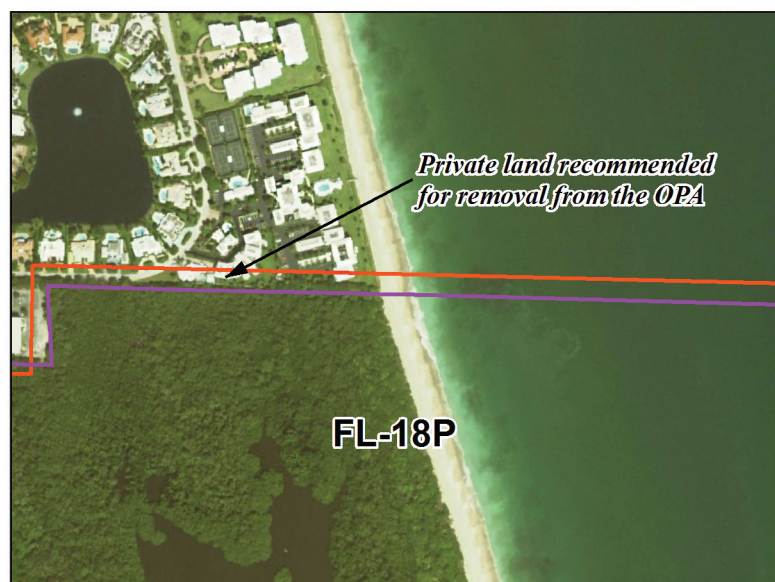


Figure 26. The northern boundary of Florida Unit FL-18P, shown in red, includes a portion of developed private land. The Service determined that this boundary was intended to mirror the boundary of John D. MacArthur Beach State Park. The final recommended boundary shown in purple is modified to follow the park boundary and remove the private land from the CBRS.





Figure 27. Private land adjacent to Delaware Seashore State Park is recommended to be reclassified from OPA Unit DE-07P to System Unit DE-07. The Service determined that this area was undeveloped when it was added to the CBRS and the boundary was intended to follow the 1990 break-in-development.

and in other cases include none of the channel within the unit. The 2008 pilot project report proposed standardizing the channel mapping protocol to include the entire channel within System Units, but to include only half of the channel within OPAs (as there is no impact to channels in OPAs, the only restriction within OPAs is on Federal flood insurance).

- Modification to Map System Unit Boundaries in Channels Using a Consistent Protocol**  
 The boundaries of pilot project System Units were modified where appropriate to include the entire extent of the channel within the System Unit instead of placing the boundary at the center of the channel. A buffer (of about 20 feet) was generally applied along developed shorelines to ensure that development and infrastructure located on the shoreline was not inadvertently included within the CBRS (see Issue 16 in Chapter 4 for additional information).
- Modification to Map OPA Boundaries in Channels Using a Consistent Protocol**  
 The boundaries of pilot project OPAs were modified where appropriate to place the boundary at the center of the channel. The Service has since recognized that

it would simplify CBRS mapping to use the same protocol for both OPA and System Unit boundaries in channels and has updated this protocol for future comprehensive mapping projects (see Issue 12 in Chapter 4 for additional information).

**No Modification**

Five of the pilot project units (Units LA-01, LA-02, FL-43, FL-80P, and S05) contain no recommended boundary modifications. This scenario only occurs in cases where the coastal barrier islands associated with the unit have not significantly eroded or prograded in such a way that requires a boundary modification and no mapping errors were identified (see Figure 28).

**Other Changes Affecting Pilot Project CBRS Maps**

In addition to the recommended boundary changes, there are two other notable changes affecting the pilot project maps that will help reduce confusion and improve the usability of the CBRS maps, which are: updating the base map imagery used for the proposed maps with newer and higher quality imagery, and reconfiguring some of the CBRS map panels.

**Updated Base Map Imagery**

Most of the base map imagery used for the proposed maps included in the Service’s 2008 pilot project report is from 1998 and 1999. The Service has replaced this imagery with newer (dated between 2013 and 2015)<sup>14</sup> and better quality imagery for the final recommended pilot project maps. The source and date of the base map(s) for each unit are included in the unit summaries in Appendix C and are printed on the title block of each map.

**Reconfigured Map Paneling**

Each official CBRS map covers a spatial extent roughly equivalent to one U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle; this spatial extent is referred to as a “map panel.” There are many places throughout the CBRS (as well as in the pilot project) where the existing map panels overlap each other, yet provide no indication that there is another unit in the same area that is shown on a different map panel. This omission is a source of confusion for users who assume that if no CBRS unit is depicted on a specific map, then there is no CBRS unit in that area. Through the digital conversion effort (between 2014 and 2016) many existing map panels were shifted and/or combined to eliminate overlaps and depict all CBRS units that exist within the spatial extent of a given map panel. Therefore, the paneling of the final recommended maps in Appendix C has been changed in most cases to be consistent with the map panels used in the digital conversion. The result of this change is that (1) the extent of the final recommended maps is slightly different than the extent of the proposed maps in the Service’s 2008 pilot project report and (2) a few maps will depict additional CBRS units that have not been revised through the pilot project. For example, the final recommended map depicting Unit P22, which is revised by the pilot project, also depicts Unit FL-71P, which is not revised by the pilot project. Changes to the configuration of the CBRS map panels do not affect the placement of the CBRS boundaries, but will help reduce confusion and improve the usability of the CBRS maps.



Figure 28. In limited cases, no boundary modification is necessary. The final recommended boundary for Florida Unit FL-43, shown in purple, is identical to the existing boundary.

**Final Recommended Acreage, Shoreline, and Structure Changes**

Table 2 summarizes the overall acreage, shoreline, and structure changes associated with the final recommended pilot project maps contained in Appendix C. The “existing” and “final recommended” numbers in this report differ from the “existing” and “proposed” numbers in the 2008 pilot project report for the following reasons:

- (1) changes were made between the existing and final recommended boundaries to address public comments;
- (2) new areas are recommended for addition to or removal from the

CBRS on the final recommended maps (that were not proposed for addition or removal on the proposed maps included in the 2008 report);

- (3) adjustments were made to fit the final recommended boundaries to the updated base map imagery;
- (4) changes were made to the existing boundaries of the pilot project units between 2014 and 2016 through the digital conversion effort (described in Chapter 2);
- (5) six units (Units L07, L08, L09; Unit FL-19; Unit FL-64P; and Unit FL-78P) were removed from the pilot project and one

unit (Unit NC-01P) was added, resulting in a total of 65 units in the pilot project;<sup>15</sup>

- (6) the updated imagery used for the final recommended maps is newer and better quality (this makes it easier to see and count structures, and also shows new construction that has occurred since the date of the base map imagery used for the proposed maps); and
- (7) changes were made to the methodology for acreage calculations (described below).

The final recommended maps for the 65 units contained in Appendix C (if adopted by Congress through legislation) would remove approximately 396 total acres from the CBRS (236 acres of fastland and 160 acres of associated aquatic habitat) and add approximately 24,510 acres to the CBRS (1,354 acres of fastland and 23,156 acres of associated aquatic habitat). The revised maps would remove about 325 structures from the CBRS and add about 35 structures to OPAs (mostly park-related). The Service is not aware of any existing private residential structures located within the areas recommended for addition to the CBRS.

The net changes were quantified by assessing the differences in acreage, shoreline, and structures between the existing and final recommended boundaries. Appendixes C and D provide the acreage, shoreline, and structure change information for each of the 65 pilot project units.

**Table 2. Summary of Final Recommended Acreage and Structure Changes**

	Fastland Acres		Associated Aquatic Habitat Acres		Total Acres		Total Structures	
	System Units	OPAs	System Units	OPAs	System Units	OPAs	System Units	OPAs
<b>Addition to the CBRS</b>	379	975	20,491	2,665	20,870	3,640	0	35
	Total: 1,354		Total: 23,156		Total: 24,510		Total: 35	
<b>Deletion from the CBRS</b>	148	88	102	58	250	146	179	146
	Total: 236		Total: 160		Total: 396		Total: 325	
<b>Net Reclassified</b>	-232	232	11,146	-11,146	10,914	-10,914	N/A	N/A
	Total: 0		Total: 0		Total: 0		N/A	
<b>Net Change</b>	-1	1,119	31,535	-8,539	31,534	-7,420	-179	-111
	Total: 1,118		Total: 22,996		Total: 24,114		Total: -290	



### *Acreage Calculations*

The total acreage of a CBRS unit is comprised of fastland and associated aquatic habitat (wetlands and open water). For the purpose of this pilot project, the wetland/fastland acreage breakdown was derived from the Service's National Wetlands Inventory (NWI) data.<sup>16</sup> The sole use of NWI data for the wetland/fastland acreage calculations for the pilot project is a change in methodology from the 2008 pilot project report. For the 2008 report, the Service calculated the wetland/fastland breakdown of acreage by interpretation of infrared aerial imagery in consultation with NWI data. The Service has since determined that the benefits of using aerial imagery, while resulting in more accurate wetland/fastland calculations, did not warrant the added cost.

The associated aquatic habitat acreage numbers include open water landward of the coastal barrier, but not nearshore waters seaward of the shoreline. For the purpose of the acreage calculation, all units were artificially closed at the seaward shoreline using a dataset digitized for this purpose (described below) before acreage calculations were performed. Although the acreage of the nearshore waters is not calculated, the entire sand-sharing system on the seaward side, including the beach and nearshore area, is included within the CBRS unit. The sand-sharing system of coastal barriers is normally defined by the 30-foot bathymetric contour. In the Great Lakes and in large coastal embayments (e.g., Chesapeake Bay, Delaware Bay, and Narragansett Bay), the sand-sharing system is more limited in extent. In these cases, the sand-sharing system

is defined by the 20-foot bathymetric contour or a line approximately one mile seaward of the shoreline, whichever is nearer the coastal barrier. See Issue 19 in Chapter 4 for additional information regarding the seaward limits of CBRS units.

### *Shoreline Calculations*

For purposes of the pilot project, the Service digitized a shoreline boundary to artificially close off the units along the seaward shoreline. This shoreline boundary generally follows the wet/dry sand line as interpreted from the base map image. Additionally, the shoreline boundary crosses any inlets and/or other dividing water bodies within each unit. In conjunction with the boundaries of the unit, the shoreline boundary is also used to define the total area of a unit that is subject to an acreage calculation (as described above).

<sup>1</sup> See endnote 25 in Chapter 1.

<sup>2</sup> Final maps produced through the digital conversion effort, which affected all of the pilot project units, were adopted for CBRS units located in Delaware and South Carolina on April 17, 2014 (79 FR 21787); units located in North Carolina on May 4, 2015 (80 FR 25314); and for units located in Florida and Louisiana on March 14, 2016 (81 FR 13407).

<sup>3</sup> 47 FR 35696

<sup>4</sup> The portion of a coastal barrier between the mean high tide line on the ocean side, and the upper limit of tidal vegetation (or, if such vegetation is not present, the mean high tide line) at the rear of the coastal barrier.

<sup>5</sup> See endnote 2 in Chapter 1.

<sup>6</sup> See endnote 28 in Chapter 1.

<sup>7</sup> AL-01P (Pub. L. 103-461); DE-03P (Pub. L. 106-128); FL-35 (Pub. L. 105-277); FL-64P (Pub. L. 110-419); FL-95P (Pub. L. 109-355); GA-06P (Pub. L. 109-354); NC-03P (Pub. L. 106-116); NC-07P (Pub. L. 108-339); NY-51P (Section 4(e) of Pub. L. 101-591); P19P (Pub. L. 103-461); P19P (Pub. L. 106-360); P32 and P32P (Pub. L. 105-277); VA-60 (Pub. L. 108-7); RI-04P, RI-05P, RI-06, RI-07, SC-01, SC-03, FL-70 (new unit); FL-70P, L07, L08, and L09 (Pub. L. 113-253); FL-64P (Pub. L. 109-581), P15, P16, and new units P15P and P16P (Pub. L. 114-128); NC-01 (Pub. L. 106-332).

<sup>8</sup> See endnote 15 in Chapter 4.

<sup>9</sup> See endnote 5 in Chapter 4.

<sup>10</sup> System Units are generally comprised of privately held areas. OPAs are generally comprised of areas established under Federal, State, or local law, or held by a qualified organization, primarily for wildlife refuge, sanctuary, recreational, or natural resource conservation purposes (Section 12 of the Coastal Barrier Improvement Act; Pub. L. 101-591). See Chapter 4 for additional information.

<sup>11</sup> See endnote 16 in Chapter 4.

<sup>12</sup> See endnote 2 in Chapter 1.

<sup>13</sup> See endnote 21 in Chapter 4.

<sup>14</sup> See endnote 9 in Chapter 4.

<sup>15</sup> See endnote 31 in Chapter 1.

<sup>16</sup> Fastland and wetland acreage numbers included in this report inherit the level of accuracy and completeness of NWI data. The NWI meta-data states that it "represents the extent of wetlands and deepwater habitats that can be determined with the use of remotely sensed data and within the timeframe for which the maps were produced. The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data, and the amount of ground truth verification work conducted. There is a margin of error inherent in the use of imagery, thus detailed on-the-ground inspection of any particular site, may result in revision of the wetland boundaries or classification, established through image analysis. Wetlands or other mapped features may have changed since the date of the imagery and/or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site." USFWS. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, May 2014. Washington, DC. <http://www.fws.gov/wetlands>