

Executive Summary

INTRODUCTION

Coastal barriers are the narrow low lying landforms located at the interface of land and sea. These unique geological features buffer the bays, salt marshes, and wetlands behind them that in turn support a great diversity of plants and animals, and protect people and property on the mainland from the full impact of hurricane force winds and storm surge. Coastal barriers serve as popular vacation and recreation destinations; however, developing and redeveloping these vulnerable and often unstable areas is costly, not only to the property owners who risk losing their homes and lives, but also to the American taxpayers who subsidize this development. Development also interferes with the natural movement of the barriers, disturbing important habitat for nesting sea turtles, migratory birds, and other fish and wildlife resources. Despite the risks associated with building on these narrow spits of sand, the aesthetic and recreational lures of coastal barriers continue to drive the development of these areas along our Nation's coasts.

Building on an effort initiated by President Carter, President Reagan and Congress took action to protect undeveloped coastal barrier habitat from intensive development. The Coastal Barrier Resources Act (CBRA), enacted in 1982, recognized that certain actions and programs of the Federal Government have historically subsidized and encouraged development on coastal barriers, resulting in the loss of natural resources, threats to human life, health, and property, and the expenditure of millions of tax dollars each year. To remove the Federal incentive to develop these areas, the CBRA designated relatively undeveloped coastal barriers along the Atlantic and Gulf coasts as part of the Coastal Barrier Resources

System (CBRS) and made these "System Units" ineligible for most new Federal expenditures and financial assistance. In 1990, Congress reauthorized the CBRA with the Coastal Barrier Improvement Act (CBIA), which also expanded the CBRS by adding new units, enlarging some previously designated units, and adding "Otherwise Protected Areas" (OPAs) as a second type of unit within the CBRS. "System Units" are generally comprised of privately held areas whereas OPAs are generally comprised of areas held for wildlife refuge, sanctuary, recreational, or natural resource conservation purposes (e.g., State parks, wildlife refuges, private conservation areas, etc.). The only Federal funding prohibition within OPAs is on Federal flood insurance. The CBRA was again reauthorized in 2000 and 2006, demonstrating consistent bipartisan support for the law across decades.

The CBRS currently contains a total of 859 geographic units covering about 3.3 million acres (400,000 acres of fastland (land above mean high tide), 2.9 million acres of associated aquatic habitat (wetlands and open water)) and approximately 2,500 shoreline miles in 23 States and territories along the Atlantic, Gulf of Mexico, Great Lakes, U.S. Virgin Islands, and Puerto Rico coasts. Of the total units within the CBRS, 585 are System Units (comprising about 1.3 million acres) and 274 are OPAs (comprising about 2 million acres). The CBRS units are depicted on a set of maps that is maintained by the Secretary of the Interior (Secretary), through the U.S. Fish and Wildlife Service (Service, we, our).

Areas located within the CBRS are not eligible for most new Federal expenditures and financial assistance. Development can still occur within the CBRS provided

that private developers or other non-Federal parties bear the full cost. Over the past 34 years, the CBRA has helped to reduce the intensity of development in these high-risk coastal areas, protect coastal habitat, and save millions of taxpayer dollars each year. Maintaining the beneficial functions of coastal barriers as natural storm buffers is important as the Nation experiences and prepares for increased flooding and erosion associated with climate change impacts due to increases in sea level rise and storm surge, and more intense and frequent coastal storms throughout the 21st century and beyond.

AUTHORITY FOR THE DIGITAL MAPPING PILOT PROJECT AND PURPOSE OF THIS REPORT

A major challenge associated with administering the CBRA over the years has been the outdated maps that depict the CBRS, many of which date back to the 1990s. CBRS maps have historically been difficult to interpret, and in some cases contain significant errors. The challenges associated with the maps have caused hardships for homeowners who were either issued Federal flood insurance policies in error or whose properties were inadvertently included within the CBRS.

Congress recognized the limitations and problems associated with the CBRS maps and took action to address them. The 2000 Coastal Barrier Resources Reauthorization Act (2000 CBRRA) directed the Secretary to conduct a Digital Mapping Pilot Project (pilot project) that would include: (1) draft digital maps for 50-75 CBRS areas (representing about ten percent of the CBRS) and (2) an accompanying report to Congress that describes the feasibility and cost of creating digital maps for the entire CBRS.

The 2006 Coastal Barrier Resources Reauthorization Act (2006 CBRRA) directs the Secretary to conduct a public review and finalize the pilot project maps, prepare digital maps for the remainder of the CBRS, and provide recommendations for expansion of the CBRS. The 2006 CBRRA specifies that this final report to Congress shall contain:

- (1) the final recommended digital maps created under the pilot project;
- (2) recommendations for the adoption of the digital maps by Congress;
- (3) a summary of the comments received from the Governors of the States, other government officials, and the public regarding the digital maps;
- (4) a summary and update of the protocols and findings of the initial pilot project report required under Section 6(d) of the 2000 CBRRA, which included:
 - a description of the cooperative agreements that would be necessary to complete digital mapping of the entire CBRS,
 - the extent to which the data necessary to complete digital mapping of the entire CBRS are available,
 - the need for additional data to complete digital mapping of the entire CBRS,
 - the extent to which the boundary lines on the digital maps differ from the boundary lines on the original maps, and
 - the amount of funding necessary to complete digital mapping of the entire System; and
- (5) an analysis of any benefits that the public would receive by using digital mapping technology for all CBRS units.

In 2008, the Service completed draft maps for 70 CBRS units (located in Delaware, Florida, Louisiana, North Carolina, and South Carolina)

and an accompanying report to Congress. The draft pilot project maps underwent public review in 2009. They were revised in 2016 to incorporate any appropriate changes based on updated aerial imagery, public input, and objective mapping protocols. These maps are included in this report as the Service's final recommended maps for Congressional consideration. Since the publication of the initial 2008 pilot project report, six units have been removed from the pilot project and one unit has been added.

This report includes final recommended maps for 65 CBRS pilot project units. The final recommended units comprise a total of 274,363 acres (13,671 acres of fastland and 260,692 acres of associated aquatic habitat) and about eight percent of the total CBRS acreage. Forty-one of the total pilot project units are System Units (comprising 257,725 acres) and 24 are OPAs (comprising 16,638 acres).

BENEFITS OF MAP MODERNIZATION AND SUCCESSES TO DATE

As required by the 2006 CBRRA, this final report includes an analysis of any benefits that the public would receive by using digital mapping technology for all CBRS units. The Service has two separate but complementary approaches underway to update the CBRS maps, which are known as “digital conversion” and “comprehensive map modernization.” These two mapping efforts and their associated benefits are described in Chapter 2.

The Service and the Federal Emergency Management Agency (FEMA) entered into an interagency partnership in 2011 to facilitate a digital conversion of the official CBRS maps. This effort modernizes the maps to a digital medium that is more useful to the public and local, State, and Federal agencies. This effort is conducted under a limited authority in the CBRA that requires a regular review and update of the CBRS maps (known as the “five-year review”). Through the digital conversion effort, the existing CBRS

boundaries are: (1) transferred and fitted to updated base maps (i.e., a recent aerial image) to ensure that the boundaries correspond with the natural or development features they are clearly intended to follow on the official maps; (2) modified to reflect any natural changes that have occurred since the maps were last updated and to incorporate any voluntary additions and additions of excess Federal property within the CBRS; and (3) in limited circumstances, modified to correct transcription errors between the boundaries approved by Congress in the past and those depicted on the official CBRS maps on file with the Service. The revised maps prepared through the digital conversion process undergo stakeholder review by Federal, State, and local officials, and are made effective administratively by the Service through a notice of final map availability published in the *Federal Register*. Changes to the CBRS that are outside the Service's limited administrative authorities under the CBRA cannot be made through the digital conversion process.

The benefits associated with digital conversion include: more accurate and user-friendly CBRS data and maps for the public; improved accuracy of CBRS boundaries depicted on FEMA's Flood Insurance Rate Maps; increased awareness of and compliance with the CBRA; and opportunities for enhanced State, local, and non-governmental conservation efforts. By the end of 2016, the Service will have completed digital conversion maps for 19 of the 23 States and territories that contain CBRS units, covering more than 90 percent of the total CBRS acreage.

Changes that are outside of the scope of digital conversion must be made through the comprehensive map modernization process. This process is more time and resource intensive because it entails significant research into the intent of the original boundaries and the development status on-the-ground at the time the areas were originally included within the CBRS, public review of the draft maps, and Congressional enactment of

legislation to make the revised maps effective.

In addition to all of the benefits of the digital conversion effort listed above, comprehensive map modernization also addresses mapping errors by removing lands that were previously included in error and conserves natural resources by adding qualifying new areas to the CBRS. Through fiscal year 2016, the Service has prepared comprehensively modernized maps for approximately 15 percent of the total CBRS acreage (including the pilot project maps).

In addition to modernizing the CBRS maps using digital technology, the Service has also modernized the delivery of CBRS information to the public by making a CBRS boundary dataset available for use in Geographic Information System applications and making the CBRS boundaries available through a CBRS Mapper on our website.

PILOT PROJECT PUBLIC REVIEW PROCESS

As required by the 2006 CBRRA, this final report was prepared after providing an opportunity for the submission and consideration of public comments. Chapter 3 describes the pilot project public review process. On April 7, 2009, the Service released to the public its initial 2008 pilot project report to Congress and announced the start of a 90-day public comment period, which was later extended to 120 days.

We distributed more than 400 copies of the report and accompanying letters requesting comments to a wide variety of stakeholders including members of Congress, Governors, county and parish chief elected officials, local and State floodplain administrators and emergency managers, State coastal zone managers, officials of other Federal agencies, park managers, and other stakeholders (e.g., non-governmental organizations). We received a total of 159 written

comments, about half of which were from private property owners. The remaining comments received were mostly from Federal agencies, State and local officials, conservation organizations, and homeowners associations. The Service solicited comments from the Governors of all 23 States and territories containing CBRS units; however no comments were received from the Governors.

Unit-specific comments were received for 26 of the 70 units in the 2008 pilot project report. The majority of the comments received related to the Florida and North Carolina pilot project units. Significant issues raised during the public comment period that are relevant to more than one CBRS unit are itemized and addressed in Chapter 4. Unit-specific comments are addressed in Appendix E.

SUMMARY OF PUBLIC COMMENTS AND SERVICE RESPONSES, CHANGES TO MAPS, AND UPDATES TO MAPPING PROTOCOLS

As required by the 2006 CBRRA, this report contains a summary of the comments received from government officials and the public regarding the digital maps and a summary and update of the protocols and findings of the 2008 pilot project report.

Through the course of the pilot project and comprehensive remapping efforts over the past several years, the Service has identified the need for updated guidance and clarification on certain CBRS mapping protocols. Chapter 4 contains: (1) a summary of the substantive overarching comments received during the pilot project public comment period and the Service's responses to those comments; (2) a summary of any changes to pilot project maps as a result of public comments; and (3) a summary of significant mapping protocols that were either updated or clarified by the Service through the pilot project.

SUMMARY AND UPDATE OF PILOT PROJECT RESULTS

As required by the 2006 CBRRA, this report contains a summary and update of the findings of the 2008 pilot project report. Chapter 5 describes 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.

The types of changes associated with the final recommended pilot project maps include modifications to reflect:

- geomorphic change,
- alignment with geomorphic features,
- alignment with development features,
- alignment with cultural features,
- additions to the CBRS based on a directive in the 2006 CBRRA,
- unit type reclassifications,
- removals from the CBRS, and
- consistent mapping of CBRS boundaries in channels.

In addition to the final recommended boundary changes, the Service replaced the base map imagery used for the proposed maps with newer and higher quality imagery. We also reconfigured some of the CBRS map panels to help reduce confusion and improve the usability of the CBRS maps.

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.

Executive Summary

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. Below is a summary table of the final recommended pilot project acreage changes.

Summary of Final Recommended Acreage and Structure Changes

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

GUIDING PRINCIPLES AND CRITERIA FOR CBRS MODIFICATIONS

Over the years, the Service has received numerous requests from property owners and their representatives from Congress to remove areas from the CBRS. Such requests require careful assessment to determine whether a removal is warranted. In the 2000 CBRRA, Congress codified criteria for the Secretary to “consider” when determining whether an area warrants removal from the CBRS. Another consideration when reviewing CBRS units is the directive in the 2006 CBRRA to the Secretary to recommend additions to the CBRS when carrying out digital mapping for the remainder of the CBRS. Chapter 6 contains the Service’s guiding principles and criteria for assessing removals from, additions to, and reclassifications within the CBRS (i.e., reclassifying areas from System Unit to OPA and vice versa).

When assessing potential modifications to the CBRS, the Service considers the following guiding principles and criteria:

Guiding Principles for CBRS Modifications

- (1) Whether the area may reasonably be considered to be a coastal barrier feature, or related to a coastal barrier ecosystem (this generally includes areas that are inherently vulnerable to coastal hazards such as flooding, storm surge, wind, erosion, and sea level rise).
- (2) Whether inclusion of the area within the CBRS is rationally related to the purposes of the CBRA (i.e., to minimize the loss of human life, wasteful expenditure of Federal revenues, and damage to fish, wildlife, and other natural resources).

Criteria for CBRS Modifications

- (1) The level of development on-the-ground at the time the area was included within the CBRS (i.e., whether the number of structures or complement of infrastructure on-the-ground exceeded the threshold for the area to be considered undeveloped).

- (2) The location of geomorphic, cultural, and development features on-the-ground at the time the area was included within the CBRS (i.e., whether the CBRS boundary lines on the maps precisely follow the underlying features they were intended to follow on-the-ground).

The Service generally will not recommend a removal unless there is clear and compelling evidence that an error in boundary delineation was made.

Protocol for CBRS Unit Classification

One of the significant lessons learned through the course of the pilot project and other comprehensive remapping efforts over the past several years is that the level of effort necessary to research, classify, and in some cases, reclassify, small discrete areas as System Unit or OPA (based on ownership at the time they were included within the CBRS) is impractical, complicated, and cost prohibitive. The Service has determined that CBRS boundaries should generally be drawn to correspond with underlying

geomorphic (e.g., shorelines and streams), development (e.g., property parcel boundaries, roads), and cultural features (e.g., county lines, park boundaries). Areas that qualified as undeveloped coastal barriers at the time of their inclusion within the CBRS should generally be classified as System Unit or OPA based on the predominant ownership of the coastal barrier system at the time it was included within the CBRS. These updated protocols are described in Chapters 4 and 6 and will be applied to future comprehensive remapping projects.

NEXT STEPS AND CONCLUSIONS

As required by the 2006 CBARRA, this report contains a recommendation to Congress for the adoption of the final recommended pilot project maps and a summary and update of the findings of the 2008 pilot project report (i.e., the extent to which the data necessary to complete digital mapping of the entire CBRS are available, the need for additional data and cooperative agreements to complete digital mapping of the entire CBRS, and the amount of funding necessary to complete digital mapping of the entire CBRS).

Adoption of the Final Recommended Pilot Project Maps

Appendix C of this report includes final recommended maps for 65 CBRS pilot project units. The Service recommends that Congress replace the existing controlling maps for the pilot project units with the final recommended maps. Enactment of these maps will address clear mapping errors that have unintended negative effects on property owners and that warrant correction. The Service's final recommended maps will become effective only if adopted by Congress through legislation.

Next Steps to Comprehensively Modernize the CBRS

The CBRA is a map-based law, and although most of the CBRS maps have been modernized through the digital conversion effort and are now more accurate and easier to use, some of them may still contain legitimate errors that warrant a comprehensive review and remapping by the Service.

Through fiscal year 2016, the Service has created comprehensively modernized maps for approximately 15 percent of the total CBRS

acreage (about 100 units including the pilot project maps). The Service has a project underway to prepare comprehensively revised draft maps for all CBRS units in eight northeastern States affected by Hurricane Sandy (about 370 units comprising approximately 15 percent of the total acreage of the CBRS), and will create comprehensively modernized maps for additional CBRS units given the availability of resources for this effort. The estimated cost for completing comprehensively revised maps for the remainder of the CBRS (about 400 units comprising approximately 70 percent of the CBRS acreage) is about \$5 million.

Comprehensive map modernization allows for the opportunity to correct errors that negatively affect property owners and expand the CBRS to include eligible undeveloped land and associated aquatic habitat. The Service supports map modernization and will continue to prepare comprehensively revised maps for remaining areas within the CBRS as resources are made available for this effort.