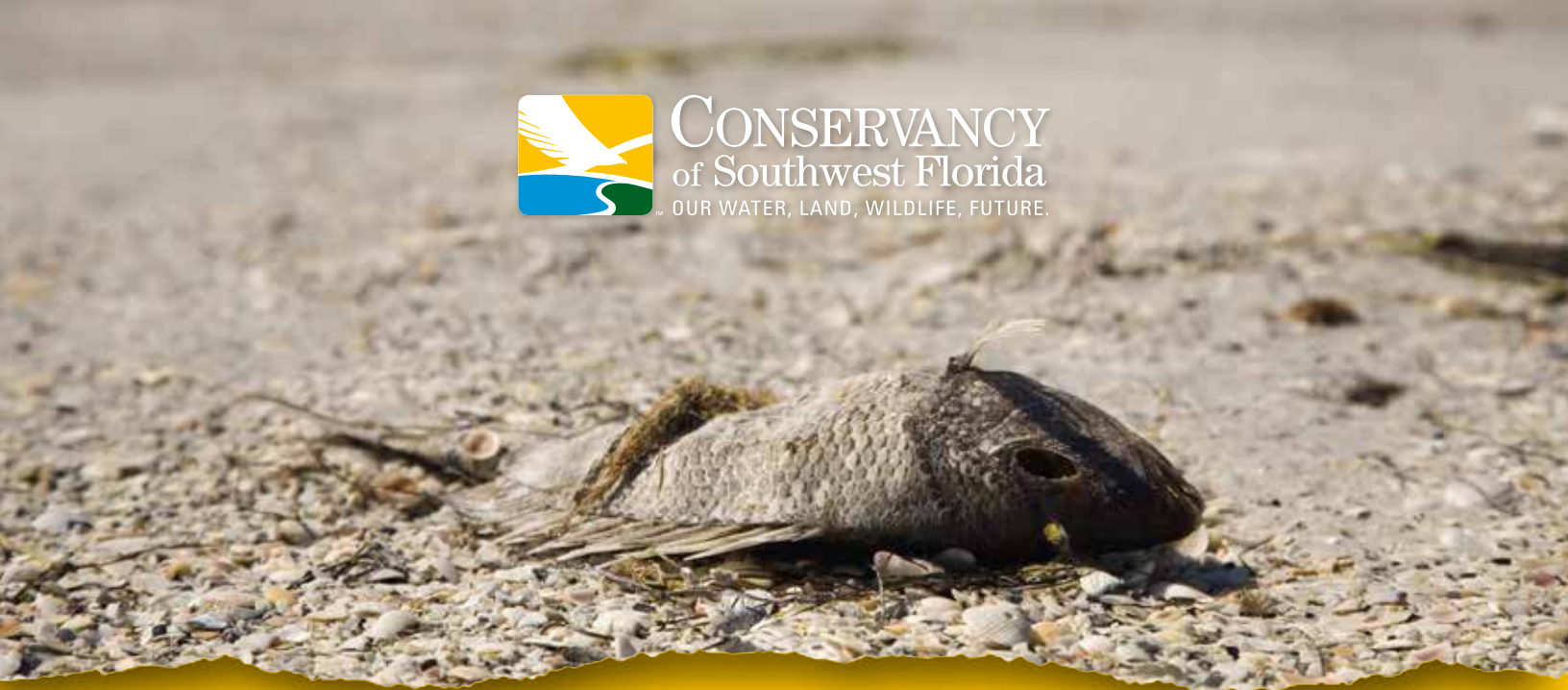
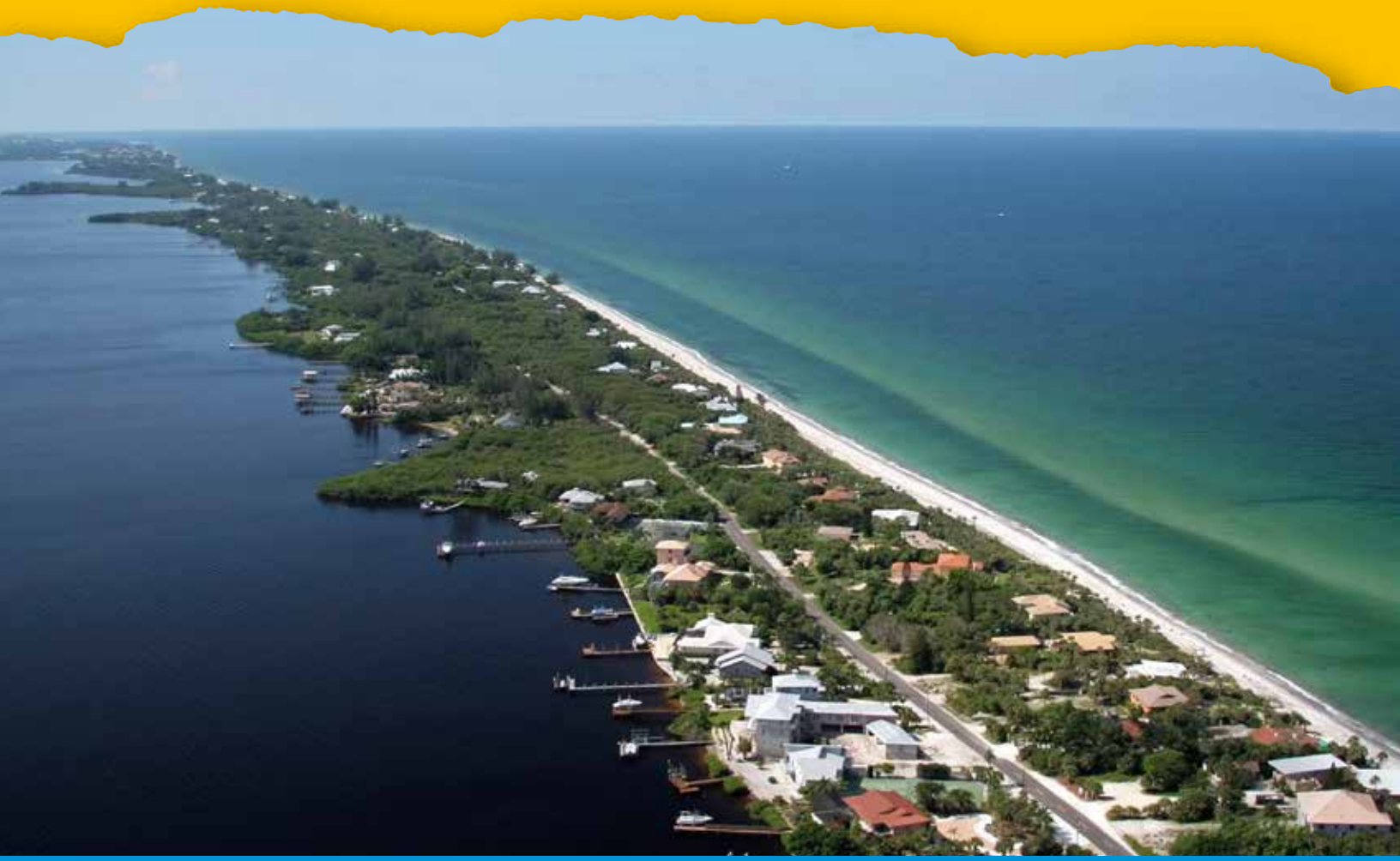


CONSERVANCY of Southwest Florida
OUR WATER, LAND, WILDLIFE, FUTURE.

Estuaries REPORT Card

A guide to understanding the health of Southwest Florida's rivers, estuaries and bays



1495 Smith Preserve Way I Naples, Florida 34102 I 239.262.0304 I www.conservancy.org/reportcard

THE HEALTH OF OUR WATERWAYS

The beauty and productivity of Florida's coastal ecosystems are driving forces in the state's economic growth. Our economy, human health and our quality of life in Southwest Florida depend on the health of our waterways.

1.2 million
Number of Florida jobs that depend on tourism*

$541 million
Estimated decrease in property values in Lee county attributed to water quality (2010-2013)**

$11.5 billion
Economic impact of the marine industry in the South Florida region, which employs 136,000 regionally***

$9.3 billion
Economic impact of the commercial fishing industry, which employs 123,000***

*Employment data from the Florida Department of Economic Opportunity (as reported by Visit Florida)
** The Impact of Water Quality on Florida's Home Values – Florida Realtors. Final Report 2015
***2014 The Marine Industries Association of Florida study

Why it Matters

Southwest Florida is home to some of the most unique habitats and natural resources in America, making it a top destination for ecotourism, scientific research, and recreational enjoyment. It also hosts some of the most productive estuaries, and many species of wildlife, plant species and aquatic life rely on this area where freshwater meets saltwater. A mosaic of mangroves, freshwater wetlands, saltwater marshes, rivers, and streams intertwine with canals, coastal development, agriculture and other human-influenced environments to create an interrelated and challenging system to manage and preserve.

The Conservancy of Southwest Florida's 2017 Estuaries Report Card is a guide to understanding the health of 10 watersheds in Southwest Florida. The report includes an Action Plan each person, community leader, business owner, and lawmaker can follow to help improve our most precious natural resource and economic driver – water.

This report provides a snapshot of the health of the region's water resources and wildlife habitat based on the water quality assessments available from the Florida Department of Environmental Protection (FDEP), hydrologic information, impervious surface cover, and wetlands, mangroves and conservation lands data from other agencies. The Conservancy of Southwest Florida graded each watershed based on two categories: water quality and wildlife habitat.

The results reveal our water is in peril. Many waterbodies are not meeting the state's water quality standards ("impaired"). The Conservancy of Southwest Florida is committed to using the information in the 2017 Estuaries Report Card to raise awareness and to advocate for improvements to our water quality and wildlife habitat in order to protect our quality of life now and for future generations.

The full report, video segments, interactive maps, references and additional information are on the Conservancy's, website www.conservancy.org/reportcard.

Grades at a Glance

ESTUARY	WILDLIFE HABITAT	WATER QUALITY
Coastal Venice	C-	C-
Lemon Bay	B	D-
Greater Charlotte Harbor	B-	C+
Pine Island Sound	A+	D
Caloosahatchee	D-	D-
Estero Bay	B-	D
Wiggins Pass/Cocohatchee	B	D-
Naples Bay	D-	D-
Rookery Bay	B+	C
Ten Thousand Islands	A+	C+

WHAT'S IN THE WATER?

Water quality grades were assessed in six categories commonly associated with water pollution.*

Pathogens (such as: bacteria)

Nutrients (such as: nitrogen and phosphorous contained in fertilizer or sewage)

Oxygen Depletion (biological oxygen demand (BOD) and dissolved oxygen (DO))

Metals (such as: copper, iron, lead, mercury)

Physical Parameters (such as: chloride, pH, turbidity, salinity)

Biology (measured by: stream condition index, lake vegetation index, others)

WILDLIFE IMPACT

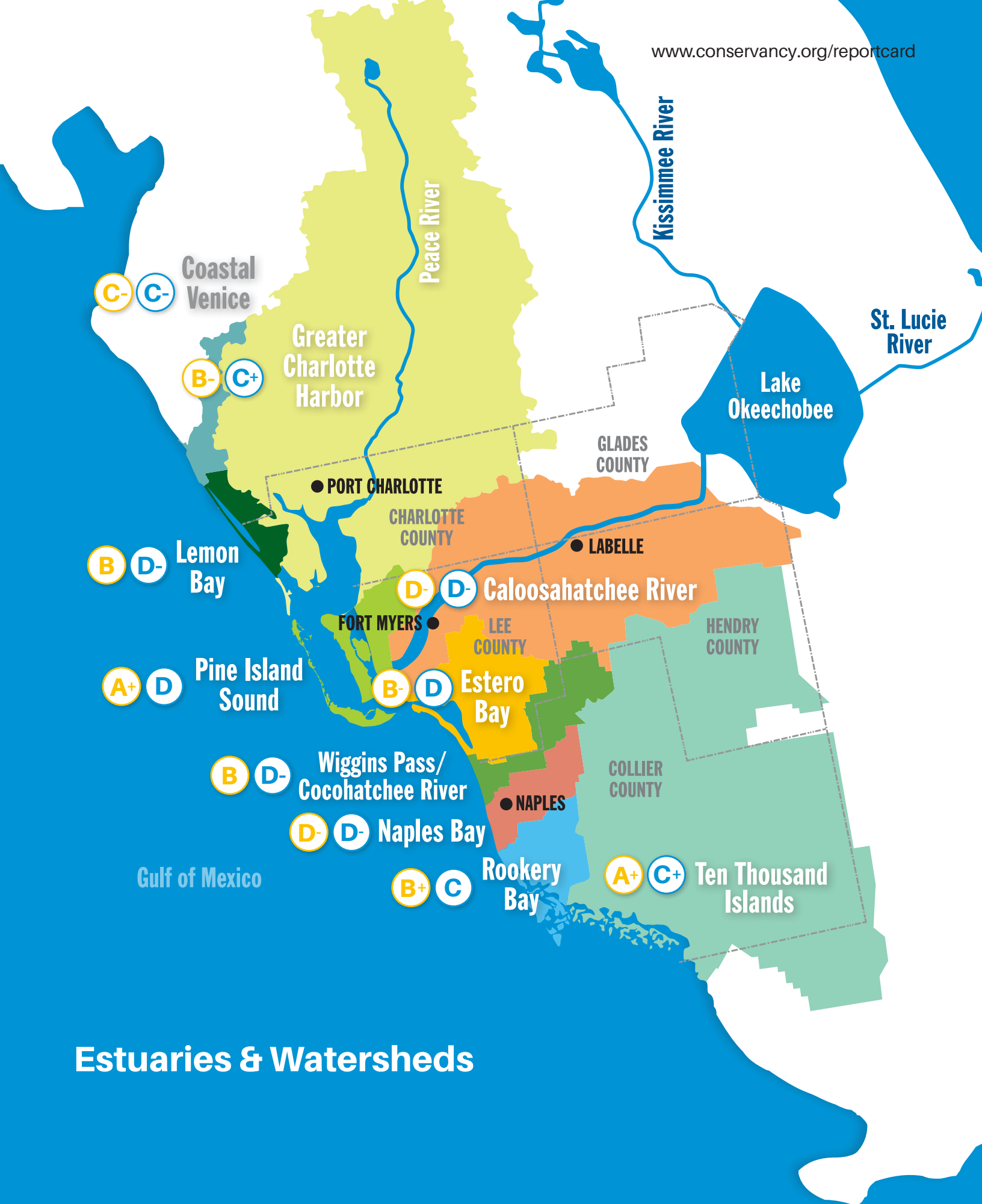
Wildlife habitat grades were assessed using three measures:**

Extent of Mangroves Remaining

Extent of Wetlands Remaining

Extent of Conservation Lands

*Full descriptions of the water quality contaminants are in the full report: www.conservancy.org/reportcard.
**The extent of both wetlands and mangroves remaining was calculated using the "predevelopment" conditions of each watershed compared to the most recent data available for current conditions.



Estuaries & Watersheds

COASTAL VENICE

Wildlife Habitat C- Water Quality C-

47% 49% 12%

The Coastal Venice watershed extends from the north of Manasota Key bridge to the Venice Inlet and stretches northeast, above the Myakka River, all the way into Manatee County. The watershed comprises three interconnected shallow bays – Lyons, Dona and Roberts – separated from the Gulf of Mexico by a barrier island. Historically, the Coastal Venice watershed was characterized by slough-like and meandering freshwater systems that flowed through seasonal wet depressions before draining to the bays. The current Venice coastline is representative of intense alteration as a result of development.

Coastal Venice

SUMMARY FINDINGS

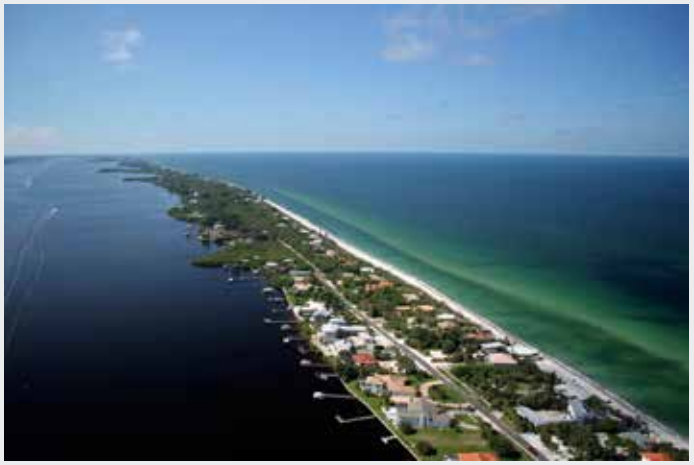
- The Coastal Venice watershed has lost more than 50% of the area's historic wetlands and mangroves, and is the third most urbanized watershed evaluated in the 2017 Report Card.
- Only 12% of the watershed is designated conservation land.
- 71% of the watershed is impaired for at least one parameter category.

LEMON BAY

Wildlife Habitat **B** Water Quality **D-**

60% 69% 26%

Extending from South Venice to the Gasparilla Island Causeway, the Lemon Bay watershed has six basins discharging into the Bay: Alligator Creek, Woodmere Creek, Forked Creek, Gottfried Creek, Ainger Creek, and Lemon Bay Coastal. Due to the high amount of urban land use, the watershed has been impacted by stormwater runoff, channelization of natural streams, increase of impervious surfaces, and conversion of natural habitat to other land uses. The tributaries to the estuary have also been transformed by ditching for mosquito control and development activities. The major types of wildlife habitat in Lemon Bay are pine flatwoods, freshwater marshes, and shrub and brushland, where one can find significant wildlife resources, including wood storks, sea turtles, manatees, and eagles.



Lemon Bay

SUMMARY FINDINGS

- The Lemon Bay watershed still retains about 70% of the area's historic wetlands and about 60% of historic mangrove coverage, yet also has the second highest percentage of urban land use of the watersheds, at 38%.
- The Lemon Bay watershed has degraded water quality with 95% of the watershed impaired for at least one parameter category.
- The most prevalent water quality problems fall into the metals category, specifically mercury, followed by the DO and nutrients categories. The nutrient impairments are likely caused by septic tank leaching and stormwater runoff, and are closely associated with the DO impairments.

GREATER CHARLOTTE HARBOR

Wildlife Habitat B- Water Quality C+

62% 73% 19%

The Greater Charlotte Harbor watershed extends from the northern headwaters of the Peace River to the coast of Charlotte Harbor, and is the largest watershed evaluated in the Report Card. This region is comprised of three basins—the Peace River, Myakka River, and Charlotte Harbor Proper. Since the 1880s, the Peace River basin has been the home of the largest phosphate mining industry in the state—producing yields to satisfy 25% of world demand and 75% of U.S. demand for phosphate fertilizer. The impacts from mining resulted in the 2004 listing of the Peace River as one of the 10 most endangered rivers in the United States. The Harbor supports important commercial and recreational fishing and shellfishing industries and is recognized internationally as a hot spot for sport fishing.

Charlotte Harbor sunset

SUMMARY FINDINGS

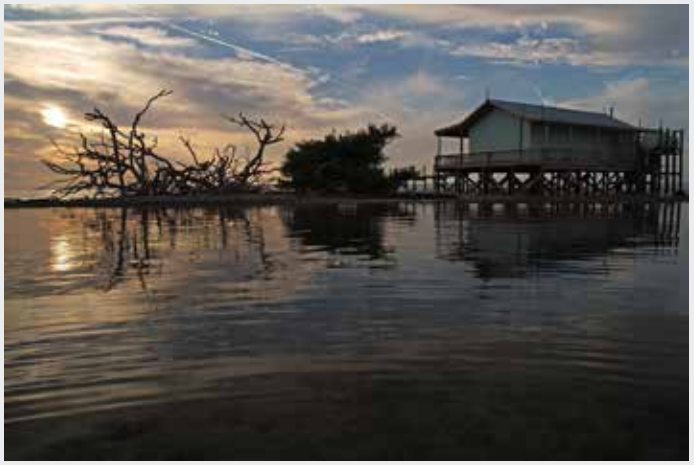
- Despite nearly 390,000 acres protected, this represents only 19% of the watershed.
- The addition of Peaceful Horse Ranch added 4,000 acres of conserved land to the watershed in 2014.
- 54% of the watershed is impaired for at least one parameter category, the most pervasive problems being dissolved oxygen, nutrients, and metals.
- 27% of the Greater Charlotte Harbor watershed was not sampled for any parameter category and no water quality monitoring data was available at the time of the Report Card's compilation to determine whether the waterbodies are meeting water quality standards.

PINE ISLAND SOUND

Wildlife Habitat A+ Water Quality D

103% 69% 56%

The Pine Island Sound encompasses Matlacha Pass, Pine Island Sound, and San Carlos Bay, as well as Pine Island and the barrier islands of Cayo Costa, Captiva, North Captiva, and Sanibel Island. Much of the ecological degradation in the Sound has been attributed to expanding urban development, water pollution from agricultural and residential runoff, and water mismanagement of the Caloosahatchee River system. Despite the impacts to this watershed, Pine Island Sound is a unique spot for wildlife. Known for its extensive seagrass beds, the estuary provides essential habitat for young fish and is home to over 100 invertebrate, 200 fish, and 150 bird species.



Afternoon sunset over the Green Fish House in Pine Island

SUMMARY FINDINGS

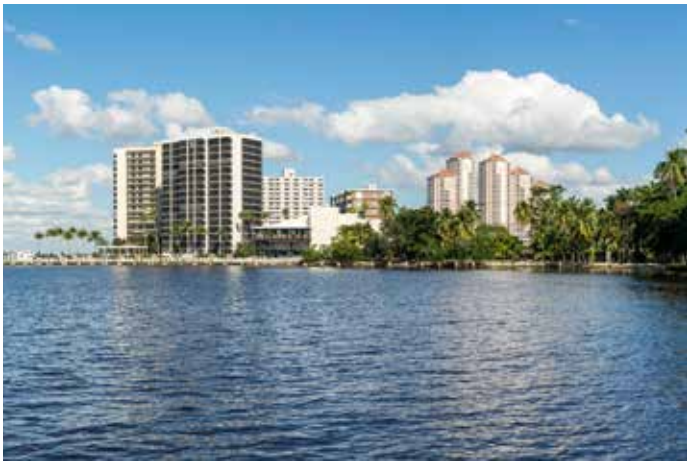
- The Pine Island Sound watershed has 69% of the region's historic wetlands remaining, and remarkably, shows a 3% increase in total mangrove coverage compared to historic acreage.
- The most prevalent water quality impairments in the watershed are metals and DO, with nutrients and pathogens tied for third.
- Nutrients in the watershed are of increasing concern, likely as a result of stormwater and sewage/septic runoff.

CALOOSAHATCHEE RIVER

Wildlife Habitat D- Water Quality D-

37% 37% 16%

The Caloosahatchee River watershed spans from the river's artificial headwaters at Lake Okeechobee to its outflow in San Carlos Bay. Over the past 150 years, the historically shallow and meandering river has been deepened, straightened, and widened into a highly managed and regulated waterway. The watershed has also experienced significant land impacts. The cities of Fort Myers and Cape Coral are centers of urban development near the coast, while agriculture is prevalent in the east. Due to the severe hydrologic alteration and development, the river and estuary's ecosystems are significantly degraded. Pollution from watershed runoff and discharges from Lake Okeechobee have impacted the water quality and salinity regime in the estuary. In 2006, the river was listed the 7th Most Endangered River in the U.S. by American Rivers.



Caloosahatchee River in Fort Myers, Florida

SUMMARY FINDINGS

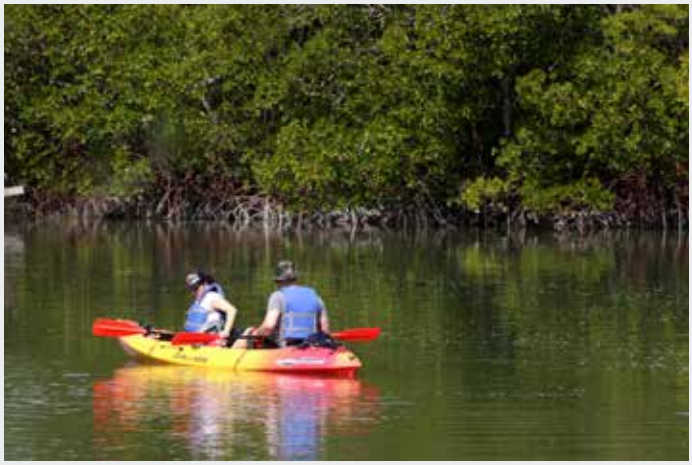
- Only 37% of the region's historic wetland and mangrove coverage remains, and only 16% of the watershed is designated conservation lands.
- The Caloosahatchee River watershed's water quality is degraded with 94% of the watershed impaired for at least one parameter category.
- Loss of oysters, submerged aquatic vegetation, and other aquatic life due to dredging, hydrologic alteration and pollution, have degraded wildlife habitat for other species.
- Due to the nutrient-rich discharges from Lake Okeechobee, combined with runoff from the watershed, blue-green algae blooms occur frequently.

ESTERO BAY

Wildlife Habitat B- Water Quality D

86% 57% 23%

The Estero Bay watershed is bordered by a line of barrier islands including Estero Island, Lovers Key, Long Key, Black Island, Big Hickory Island, and Little Hickory Island. Historically, a lack of substantial freshwater input and weak tidal exchange led to the formation of the lagoon-type estuary found in Estero. Because the bay is supplied with freshwater from a number of small creeks and rivers rather than one major source, it is extremely sensitive to runoff and upland discharge. Runoff containing fertilizer and other nutrients, pesticides, and contaminants continues to increase as a result of more impervious surfaces and development. Runoff will continue to be a management challenge as the already highly-populated coastal and the more sparsely populated inland areas are experiencing an influx of new residents. The Bay has lost historic seagrass and oyster bed coverage due to boat propeller scarring, altered hydrology, and dredging activity.



Kayakers on the estuary at Lovers Key State Park

SUMMARY FINDINGS

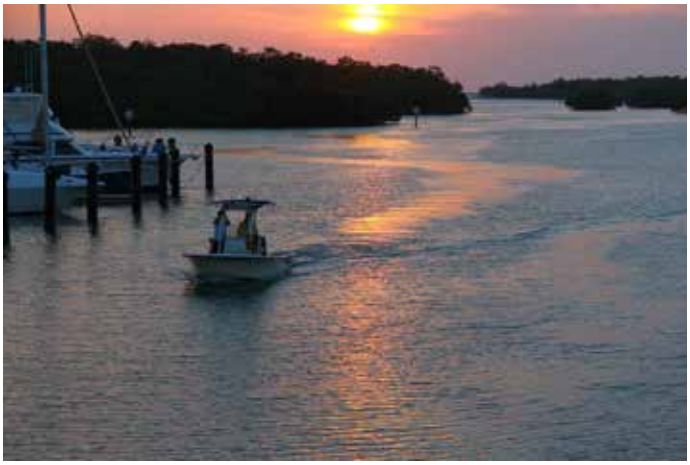
- The Estero Bay watershed has about 57% of the area's historic wetlands and about 86% of historic mangroves remaining. Portions of the watershed are highly developed, but the coastal mangrove fringe has been substantially preserved.
- Development has continued to increase both in the coastal region of the watershed and inland, impacting the Bay's tributaries, wetlands, and wildlife habitat.
- Approximately 5,000 acres of wetlands in the Estero Bay watershed have been converted to other land uses – including urban - since 2004, according to the most recent land use data available (2012).
- The Estero Bay watershed's water quality is poor, with 84% of the watershed impaired for at least one parameter category, most notably metals (iron), DO, and pathogens (fecal coliform).

WIGGINS PASS/ COCOHATCHEE RIVER

Wildlife Habitat B Water Quality D-

66% 70% 27%

The Wiggins Pass/Cocohatchee River watershed covers a long, narrow strip between Estero Bay to the north and Naples Bay to the south. The Cocohatchee River and canal is the major tributary to the watershed. Wiggins Pass has been dredged since the 1950s to allow navigation into the estuary and the Cocohatchee River. In the western portion of the watershed, increased urban development in North Naples and Bonita Springs has led to the destruction of mangroves and wetlands, and the alteration of the watershed's hydrology. The extensive conservation lands in the Corkscrew Regional Ecosystem Watershed in the eastern part of the area attract nature enthusiasts and eco-tourists. A variety of wildlife continues to live in the sanctuaries of remaining natural habitat.



Cocohatchee River

SUMMARY FINDINGS

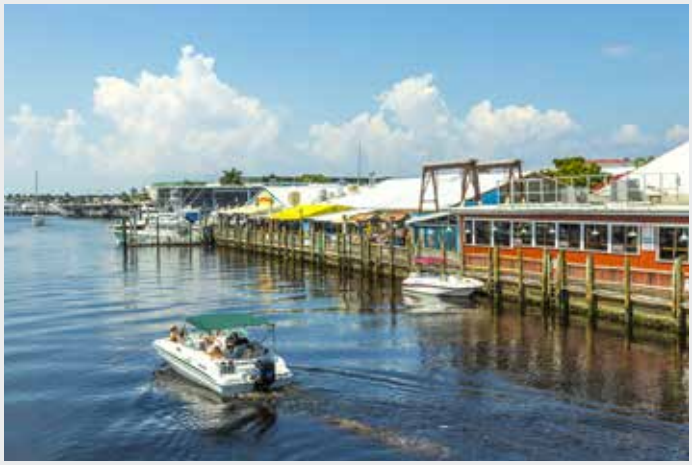
- The Wiggins Pass/Cocohatchee River watershed has about 70% of historic wetlands remaining and about 66% of historic mangrove coverage remaining.
- The watershed is 99% impaired for one or more parameter categories.
- The most prevalent water quality impairments are DO, metals (copper and iron), and fecal coliform. Potential sources of fecal coliform in the estuarine area include "loadings from surface runoff, wildlife, pets, leaking or overflowing sewage lines, and leaking septic tanks." (FDEP Fecal Coliform Total Maximum Daily Load (TMDL) for the Cocohatchee River Estuary)

NAPLES BAY

Wildlife Habitat D- Water Quality D-

19% 30% 1%

Naples Bay is a shallow and narrow estuary. The contributing watershed has increased dramatically from 6,400 acres to 89,922 acres due to hydrologic alterations, and the construction of the Golden Gate canal system. Naples Bay was first dredged in 1930, followed by more intensive dredge-and-fill developments in the 1950s and 60s as the population continued to increase. The development of Naples has led to intensive land alteration activities such as canal construction and urban development that have greatly impaired water quality and destroyed shoreline habitats along the bay. Naples Bay proper has lost approximately 70% of its mangrove forests, 80% of its oyster reefs, and 90% of its seagrass beds since 1950.



Naples Bay at Old City Dock

SUMMARY FINDINGS

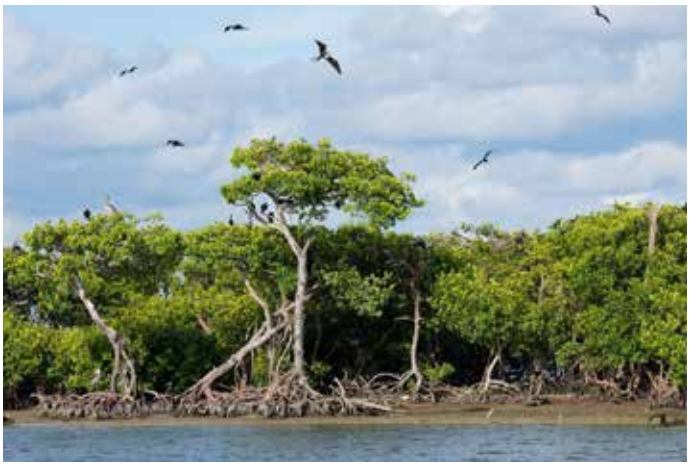
- Naples Bay is the most urbanized watershed evaluated in the Report Card, at 61%. The intensive urbanization has contributed to the lowest percentage of conservation lands in the report, at a mere 1% of the entire watershed.
- The watershed's water quality is degraded with 92% of the region impaired for at least one parameter category. The major water quality impairments listed are DO and metals (copper and iron).
- Copper sulfate treatment for algae in stormwater ponds has been linked to the copper impairments in the watershed.
- When the Golden Gate Canal was built to drain the Northern Golden Gate Estates canals, it drastically altered the hydrology of the area. As a result, freshwater flows increased during the wet season by 20 to 40 times historic flows, altering the sensitive balance that once supported fishes, oysters, and seagrasses in the bay.

ROOKERY BAY

Wildlife Habitat B+ Water Quality C

72% 69% 52%

The Rookery Bay watershed is located south of Naples. The main tributary to Rookery Bay is Henderson Creek. Canal systems and creeks receiving pollutants from developed areas flow into the more natural areas of the watershed. Several large low-density residential communities have also been constructed in the Rookery Bay watershed since 2011. Despite ongoing development, Rookery Bay is still predominately comprised of wetlands, including mangrove swamps, wet pinelands, and cypress swamps, as well as upland habitat including pine flatwoods. Described as "one of the few remaining undisturbed mangrove estuaries in North America," the estuarine environment and surrounding upland hammocks of the bay provide prime habitat for a myriad of wildlife.



Rookery Bay

SUMMARY FINDINGS

- The Rookery Bay watershed has 69% of the area's historic wetlands remaining and 72% of historic mangrove coverage remaining.
- The percentage of conservation lands is 52%, the second highest amount of preservation in the watersheds evaluated, and the area is recognized as unique habitat for wildlife.
- Approximately 1,500 acres of wetlands have been converted to urban use since 2004, according to the most recent land use data available (2012). A number of current wetland areas are located within Planned Unit Developments, which have not been built yet.
- Rookery Bay's watershed water quality is in the mid-range with 42% impaired for at least one parameter category.

TEN THOUSAND ISLANDS

Wildlife Habitat A+ Water Quality C+

99% 89% 69%

The Ten Thousand Islands watershed is a network of land, islands, small bays, and tributaries, with the eastern extent of the watershed reaching into Everglades National Park, the northern end reaching into Hendry County, and the southern end stretching into Monroe County. The ongoing popularity of the coastal destinations of Naples and Marco Island to the west has kept this watershed relatively undeveloped. The watershed is made up of various habitats, including cypress swamps, mixed shrubs, and pine flatwoods, and its vast mangrove swamps and freshwater marshes provide exceptional feeding and nursery grounds. Nature preserves provide home to over six species of federally-listed endangered or threatened animals, including the red-cockaded woodpecker, wood stork, Everglades snail kite, Cape Sable seaside sparrow, and the Florida manatee.

Ten Thousand Islands

SUMMARY FINDINGS

- The watershed has 89% of the region's historic wetlands remaining and 99% of its historic mangrove coverage.
- The Ten Thousand Islands is renowned for its extensive mangrove forests and wildlife habitat and has the highest percentage of conservation lands (69%) of the watersheds evaluated in the Report Card.
- Low DO is the most prevalent impairment listing. Agriculture is the second most common land use in the watershed besides wetlands, and runoff from agricultural operations could be contributing to nutrient related pollution problems and low DO.

ACTION PLANS

Ways YOU can Protect Our Water Resources and Wildlife Habitat

While large-scale water restoration projects are important, everyone can take action to improve the quality of their local waterways:

- Contact your government representatives. Sign-up to recieve E-Action Alerts to stay informed when your voice is needed: www.conservancy.org/reportcard.
- Dispose of your waste properly.
- Conserve water.
- Participate in cleanup days.
- Convert your yard into a Florida-friendly landscape.

Ways Policy-Makers can Protect our Water Resources and Wildlife Habitat

- Prevent additional wetlands loss.
- Update statewide stormwater standards for new development and redevelopment.
- Implement and fund comprehensive and consistent water quality monitoring.
- Support and fund conservation land acquisition programs to preserve water resources and wildlife habitat.
- Support and fund hydrologic and water quality restoration plans.

Discover more ways you can protect our estuaries in the full report www.conservancy.org/reportcard.

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Thank you to the Conservancy of Southwest Florida Board of Directors: Kenneth Krier, Board Chair; Van Williams, Vice Board Chair; Rob Moher, President and CEO; Ed Eaton, Treasurer; Stephanie Goforth, Secretary; Lew Allyn, Dennis Brown, Phil Collins, Carol Dinardo, Phil Gresh, John Hall, Dr. Judith Hushon, Loralee LeBoeuf, Wayne Meland, Gerri Moll, Tom Moran, Dr. Kamela Patton, Jane Pearsall, Dave Rismiller, Mayela Rosales, Robert Saltarelli, Sue Schulte, Lynn Slabaugh, Sharon von Arx, John R. Walter, Nancy White and Karl Williams.

The recommendations listed in the 2017 Estuaries Report Card are those of the Conservancy of Southwest Florida and do not necessarily reflect the view of our sponsors or reviewers.

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OUR WATER, LAND, WILDLIFE, FUTURE.

Protecting Southwest Florida's unique natural environment and quality of life ... now and forever.

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