

# **Dona Bay Oysters**



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# Chapter 1

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## Concept title

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Oysters as An Environmental Indicator for Dona Bay

Concept definition. Oysters make good environmental indicators for watershed management in the Dona Bay watershed.



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# Chapter 2

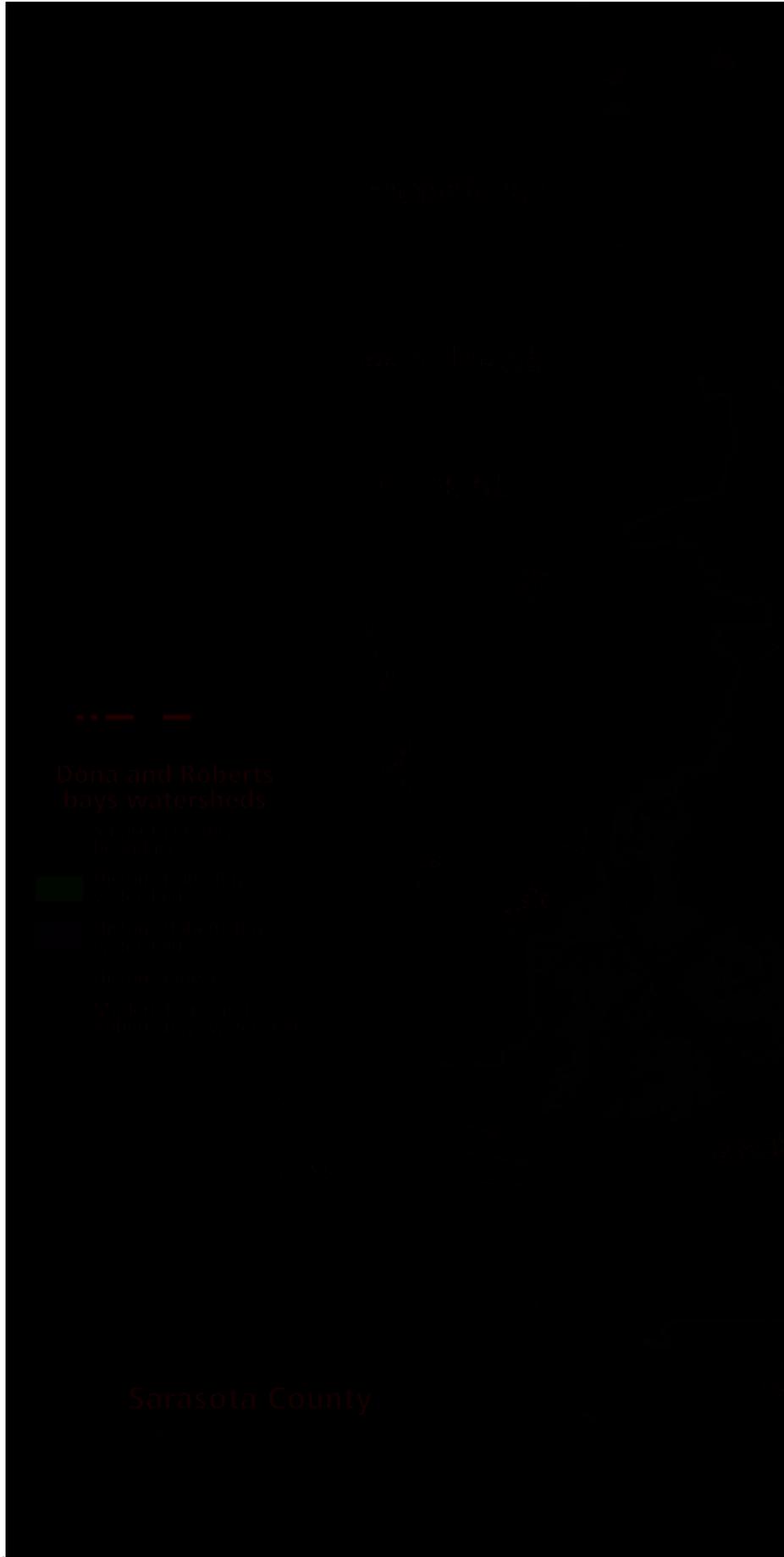
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## Dona Bay Watershed Background

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The Dona and Roberts Bay watershed in Sarasota County currently contains 62,376 acres and extends from approximately State Road 681, south to Center Road, east to the Myakka River and North to just beyond the Manatee County Line. The watershed contains the City of Venice (including the Island of Venice) as well as the southern portion of Casey Key. In addition to the barrier islands and coastal mainland fringe, the Cow Pen Slough (including Shakett Creek, Fox Creek, and Salt Creek), Curry Creek, and Hatchett Creek drainage basins make up the watershed landmass. The communities of Laurel, Nokomis, Bird Bay, Capri Isles, Pelican Pointe, and Chestnut Creek as well as the Hi-Hatt, LT, and Hawkins ranches are all located within this watershed. Most of the Dona Bay watershed is rural in character, while most of the Roberts Bay watershed is currently developed Venice Inlet Based upon the 1847 survey, the Dona/Roberts Bay watershed was significantly smaller than it is today. The original Cow Pen Slough was one of the largest natural slough systems in the County that eventually meandered south and east towards the Myakka River. The 1847 survey of Sarasota County shows that Curry Creek and Hatchett Creek extended only a few miles inland. Fox Creek and Salt Creek joined together to form Shakett creek. The watershed has experienced substantial hydrologic alterations since 1847. In the 1950's a canal was extended from Roberts Bay to the Myakka River. Constructed by private property interests, this canal was designed to relieve flooding on the Myakka River. Known as Blackburn Canal, it intercepted flows from the Myakka River just north of the present day I-75 bridge and conducted them west into Curry Creek and Roberts Bay. The entire canal was constructed below sea level and resulted in the deepening and straightening of the east end of Curry Creek. It is estimated that this canal is capable of accommodating 10% of the flood flows of the Myakka River and possibly up to 7% of the total freshwater volumes from the Myakka River. In the 1960's the United States Department of Agriculture's Natural Resource Conservation Service (now known as the Soil Conservation Service) embarked on one of the most significant drainage works in the history of Sarasota County. The work plan called for the construction of a large canal system with water level control structures from Shakett Creek, through Cow Pen Slough and north to Manatee County. The resulting network of drainage ditches and canals introduces excessive amounts of freshwater to Dona Bay enlarged

the Dona/Roberts Bay watershed from 15 square miles to about 75 square



miles.

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# Chapter

# 3

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## Oysters As Indicators

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Oysters have specific environmental requirements and are susceptible to environmental fluctuations. For example, salinity is a primary factor that affects oyster status. Optimal salinity range for oysters is 15 ppt - 25 ppt (Kennedy et al., 1996). Salinities below 10 ppt affect reproductive success. Salinity below 3 ppt is lethal to most juvenile oysters (spat). If salinity remains below 2 ppt for more than a month, most adult oysters perish. The growth rate of oysters slows above 30 ppt and they become more susceptible to predators, parasites, and disease. Oysters also provide shoreline stabilization. Due to their wide variety of ecosystem functions and values, oysters are considered a keystone species, or a species that is the foundation on which an entire community is based. Oyster beds provide habitat for many types of marine fauna. They also provide habitat for species that are adapted to oyster beds, such as oyster drills, conch, mud crabs, other bivalves, and specialized fish. An individual oyster can filter between 4 and 40 liters of water per day (Volety et al, 2003), providing a valuable water quality function.

Oysters grow near the mouths of most of the tidal creeks. Due to their immobility, importance as a habitat, responsiveness to environmental change, and water quality enhancement capabilities, oysters are relatively easy to monitor and an important indicator of estuarine health. Oysters have always been a prominent feature in the Dona and Roberts Bay estuary and make an excellent indicator species to monitor for watershed status.



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# Chapter 5

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## Oysters In Dona Bay

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Because of the hydrologic alterations mentioned earlier the Dona and Roberts Bay oysters are susceptible to the volumes of fresh water coming down the slough. Rainfall is a driver for these volumes. Over the course of 10 years of monitoring it is evident that the percent live oysters drops over the course of our wetter years and rises during the seasons of lower rainfall. The historic average rainfall for our area according to the Center for Watershed Management at the Southwest Florida Water Management District is around 52 inches a year. Only two years (2003 and 2006) over the course of the ten year monitoring program exceeded the average rainfall. The lowest percent live oyster scores have all occurred after summers with higher than average summer rainfall amounts. Fall oyster monitoring events have also shown their lowest scores during the years that have had the wettest summers.

Percent live oysters respond to increased runoff and volumes of freshwater discharged through Cow Pen Slough and Blackburn Canal. Large volumes deplete salinity levels causing oysters to close up. Prolonged exposure to salinity below 10ppt can cause mortality. Due to the alterations of the watershed, mainly the construction of Cow Pen Slough and Blackburn canal, the excess volumes of freshwater affect the health of oysters.

