

# wetland health report card

CENTER FOR THE INLAND BAYS STATE OF THE BAYS REPORT SERIES 2009-2010



The wetlands of the Inland Bays help supply clean water and protect property from flooding and coastal erosion. They also sustain diverse wildlife populations. But, due to activities that have filled and altered these wetlands, these services have been reduced. This report card uses current research to present the health of wetlands in the Inland Bays Watershed.

## why are wetlands important?

- A one-acre wetland can hold up to 1 million gallons of water. Wetland protection and proper management equals less flood damage.
- Wetlands can remove pollutants before they enter our drinking water, streams, and bays. Vegetated buffers around wetlands enhance this feature.
- Wetlands contribute filtered water to drinking water supplies.
- Wetlands prevent erosion of uplands, keeping property safe and sediments out of the water.
- Wetlands provide habitat for rare plants and animals. They are also critical nesting areas for many birds, and nursery habitat essential to sustain fish and shellfish species.
- Wetlands can store large amounts of carbon. When wetlands are degraded, greenhouse gases are released into the atmosphere.

## changes in wetland acreage

The Inland Bays watershed has lost approximately 60% of its wetland resources since European settlement. Nearly all lost were freshwater/nontidal wetlands. An analysis conducted on loss occurring between the early 1980's and 1990's showed that most of the modern nontidal loss was due to the conversion of wetlands to development, farm fields, and pond construction. Saltmarsh/tidal wetlands loss was due primarily to residential development, excavation and impoundments. A new study of wetland acreage changes during the past 15 years will be available soon.

Currently wetlands represent 16%\* of the watershed. For wetlands to continue to provide valuable services to the citizens of Delaware, additional loss must be reduced as much as possible. Many of the remaining wetlands can be managed better to improve the services they provide.



*The bays' beautiful backdrop is the saltmarsh, which support recreation and estuary life, like this nesting osprey.*

The research presented here will be used to develop a voluntary wetland restoration and management plan for the watershed and inform landuse planning that could impact wetlands.

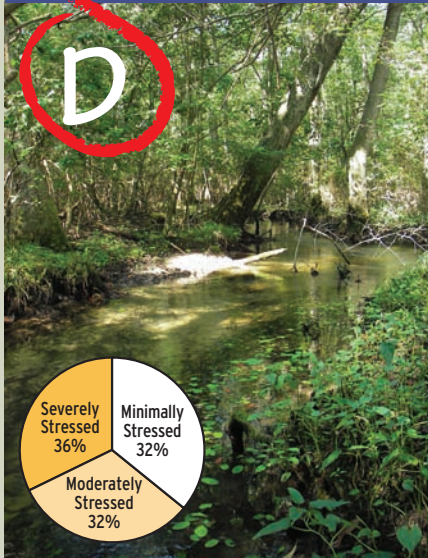
*\*This percentage is based on the 2007 Land Use Land Cover mapping effort.*

Read on to learn about the health of the remaining wetlands and what can be done to improve and protect them.



# How are our remaining wetlands fairing?

## health of riverine wetlands



Riverine wetlands occur next to natural streams and provide storage for flood waters and groundwater. The water that moves into these wetlands is cleansed before it moves downstream. These wetlands also absorb water to reduce downstream flooding.

### Common stressors degrading riverine wetlands:

- Channelization of streams (disconnecting wetlands from streams)
- Invasive plant species
- Filling of wetlands

**Recommendations:** Restore channelized streams to more natural streams, control invasive plants.

## health of flat wetlands



Flat wetlands are typically located at the headwaters of the watershed and on very low sloped lands. These wetlands can absorb heavy precipitation and filter water slowly to surface and groundwaters, prevent flooding downstream, improve water quality, and provide wildlife habitat in large forested

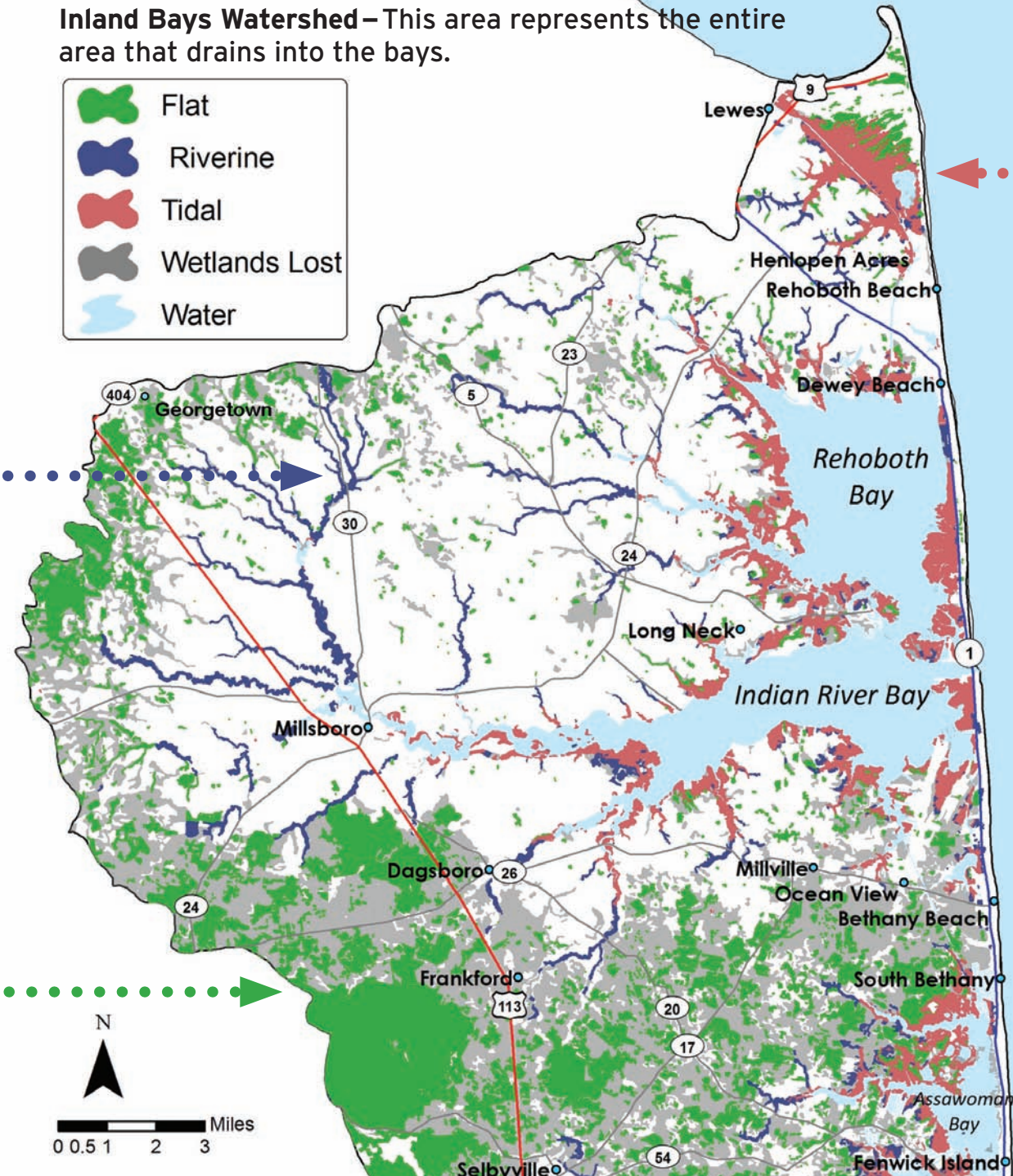
areas. Many are not protected by Federal or State wetland regulations.

### Common stressors degrading flat wetlands:

- Ditching to remove water
- Forest harvesting
- Filling of wetlands
- Roads

**Recommendations:** Protect large forest blocks, restore natural distribution of water, implement sustainable forest management.

**Inland Bays Watershed** – This area represents the entire area that drains into the bays.



### why monitor wetlands?

Understanding the condition of wetlands and how human and naturally caused stressors are impacting wetland health will aid resource agencies and conservation partners to better guide wetland protection and restoration efforts and inform land use decisions.

### how are wetlands monitored?

DNREC and the Center for the Inland Bays researched 149 wetland sites in the watershed with the Delaware Wetland Assessment Protocols from 2005-2008. Measurements of biological and physical indicators of wetland condition are taken including vegetation, soils, hydrology, surrounding land use, and stressors impacting the wetlands (e.g., invasive plants, ditching, fill, development and agriculture).

## health of tidal wetlands



Tidal wetlands are regularly flooded by the tide and surround the edge of the bays. They are highly fertile and are some of the most productive ecosystems on earth. They provide coastal populations with critical services by reducing flooding from storms, controlling erosion, improving water quality and providing habitat for birds,

mammals, and important commercial fisheries.

### Common stressors degrading tidal wetlands:

- Wetland diking
- Ditching that alters tidal flow
- Invasive plants
- Hard surfaces that limit marsh migration
- Development adjacent to marshes

**Recommendations:** Minimize development adjacent to wetlands, restore natural distribution of water, control invasive plants.

### how are wetlands scored?

The measurements of wetland health indicators are used to produce condition and function scores illustrating the health of the Inland Bays' wetlands. Scores are reflective of how similar assessed wetlands are to least disturbed wetlands of similar type. The data are collected using scientifically robust field protocols at each site. The overall condition (grade) for each wetland type is an average based on a statistically representative sample in the watershed (approximately 50 sites for each wetland type). The pie charts represent the percentage of sites ranging from minimally stressed to severely stressed for each wetland habitat type.

For more information about the methods used to collect the data and copies of the full reports, see contact information on the last page.

### what wetlands are at risk for loss?

This report card highlights the fact that the Inland Bays watershed has lost much of its original wetlands. Many of the remaining wetlands are in poor health and are also at risk to be lost under certain circumstances. Many nontidal wetlands are threatened because of gaps in existing regulations or possibly due to limitations of enforcement to reduce illegal impacts. Recent Supreme Court decisions have created dilemmas in determining which wetlands and waterways are regulated under the Clean Water Act. This has resulted in a period of vulnerability for some wetlands.

In Delaware, as much as 20% of nontidal/freshwater wetlands may be considered isolated (pending Army Corps determination) and consequently may be unregulated.

There are ways that researchers and the public can work together to better protect the health and existence of our remaining wetlands and restore lost sites. Please read on.



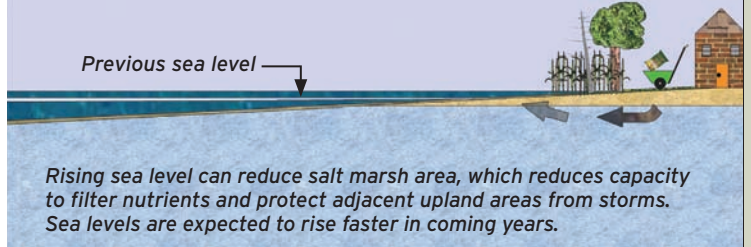
# working together for wetlands!

## sea level rise

### CURRENT SEA LEVEL



### FUTURE SEA LEVEL



### what is being done

Research on the impact of sea level rise and determining wetlands that are most at risk.

### goal

Allow marshes the ability to migrate landward and adapt to sea level rise by providing buffers between wetlands and development or construction.

### what you can do

Request that resource and landuse planning agencies require buffers that better preserve wetlands and reduce hardened surfaces near wetlands.

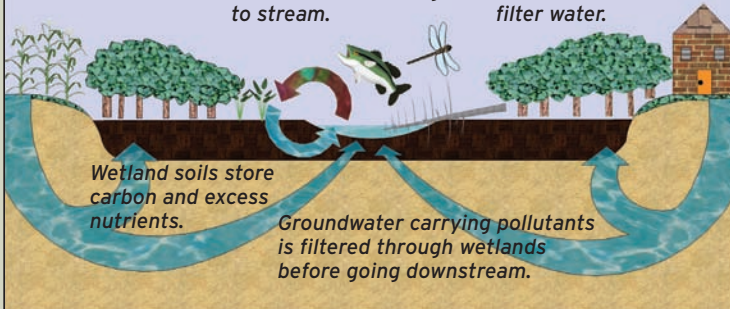
## stream channelization & ditching

### NATURAL RIVERINE WETLAND

Diverse plants provide good wildlife habitat.

Floodwaters are stored and filtered by wetland soils before returning to stream.

Beneficial insects and fish thrive among natural debris that filter water.

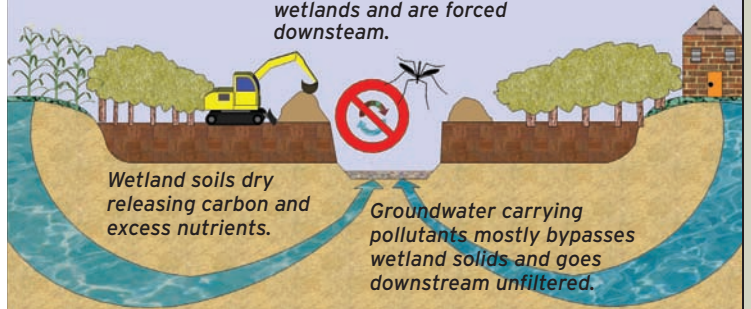


### CHANNELIZED RIVERINE WETLAND

Plants less diverse, provide lower quality wildlife habitat.

Stream channels are dug out. Floodwaters cannot be stored and filtered by wetlands and are forced downstream.

Habitat for beneficial insects and fish is less.



Determined to be the greatest stressor in the watershed. Presently, 87% of waterways are channelized or ditched. Above is a generalized depiction of the effects of channelization.

### what is being done

Using our wetland condition data to develop restoration and protection plans to target areas most in need.

### goal

Where feasible, reconnect streams with their adjacent riverine wetlands.

### what you can do

Consider voluntary restoration programs if you're a landowner, support the funding of restoration through conservation partners such as the Natural Resources Conservation Service (NRCS), the U.S. Fish and Wildlife Service, and Ducks Unlimited.

You can make a difference by living a more watershed friendly lifestyle:

- Utilize living shorelines rather than rip-rap or bulkheads.
- Reduce impervious hard surfaces on your property.
- Landscape with native local plants.
- Support better wetland protection by contacting your local decision makers.
- Look to the Wetland Public Participation Guidebook found at [www.dnrec.delaware.gov/admin/delawarewetlands](http://www.dnrec.delaware.gov/admin/delawarewetlands)
- Get involved in your watershed by volunteering with the Center for the Inland Bays!

Supporting technical reports can be found on the listed websites.



CENTER FOR THE INLAND BAYS

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