OYSTER REHABILITATION, RESTORATION AND MANAGEMENT IN NORTH CAROLINA

NC DIVISION OF MARINE FISHERIES

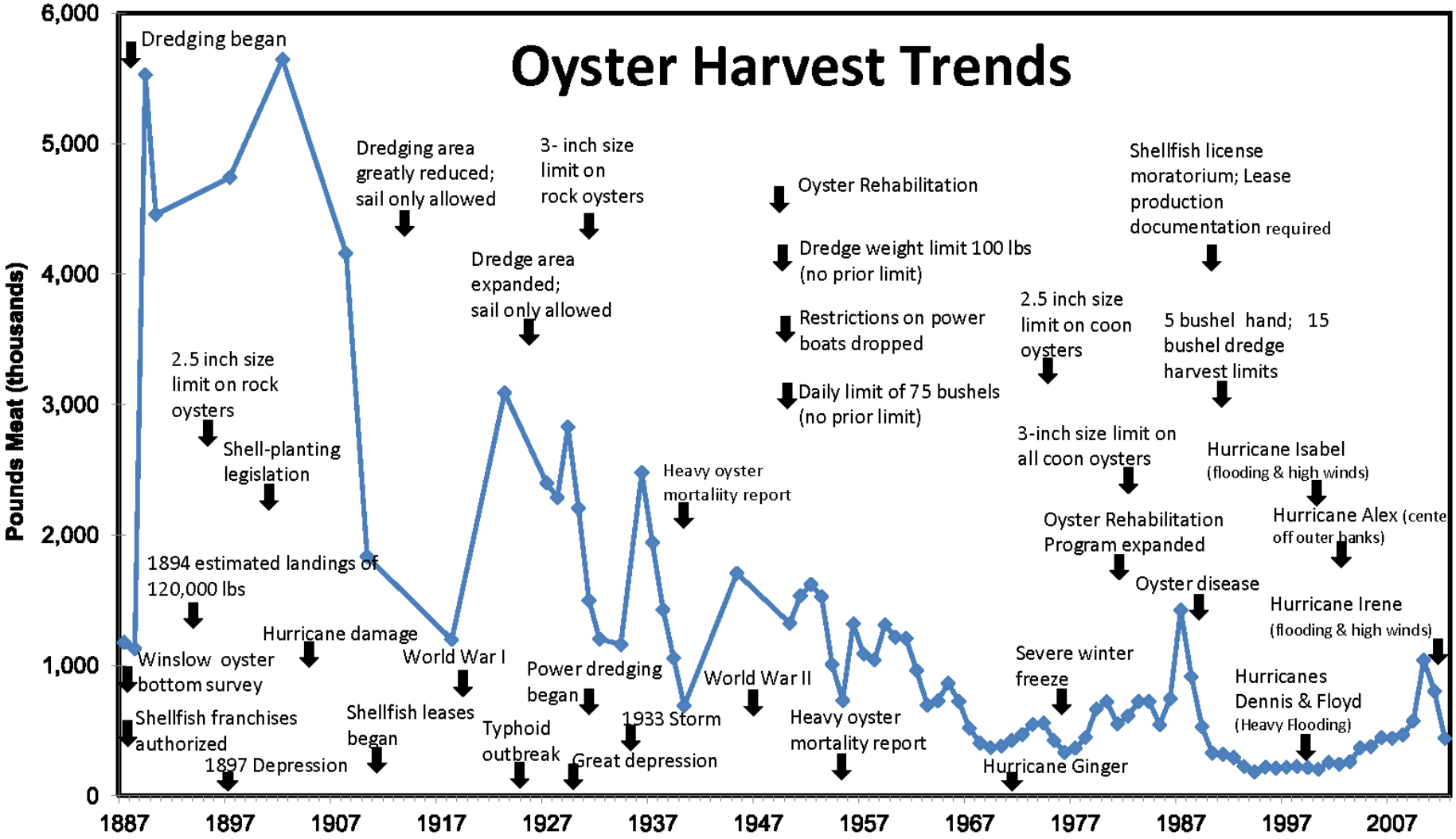
November 2013

History of Oysters in North Carolina

- Wide distribution of shell middens indicates utilization by Native Americans
- Early coastal residents bartered bushels of oysters for agricultural staples
- First harvest restrictions established in 1820's
- Harvest primarily in shallow areas with hand implements (rakes and tongs) until mid 1800's
- Increasing demands for oysters after the Civil War in northern markets and development of railroads and canneries lead to expansion of the fishery in NC
- Depleted stocks in VA. and MD. brought oystermen and dredges south to harvest virgin deep water oyster rocks

Oyster History cont..

- Increased harvest pressure and concerns over a declining population prompted the NC Legislature to request a survey of the oyster resources of the state from the Federal Government in 1885 – Lt. Frances Winslow USN, concluded the study in 1889
- Conflicts between “tongers” and “dredgers” and residents and non-residents resulted in an “Oyster War” in 1891 that resulted in a ban on oyster harvest by non-residents
- The next ~100 years was an effort to manage an oyster stock that was affected by unsustainable harvest, the growth of the timber industry, agriculture, industrialization and infrastructure development all contributing to decreased water quality


Oyster Harvest Trends
Pounds Meat (thousands)
6,000
5,000
4,000
3,000
2,000
1,000
0
1887
1897
1907
1917
1927
1937
1947
1957
1967
1977
1987
1997
2007
Dredging began
Dredging area greatly reduced; sail only allowed
3- inch size limit on rock oysters
Dredge area expanded; sail only allowed
Oyster Rehabilitation
Dredge weight limit 100 lbs (no prior limit)
Restrictions on power boats dropped
Daily limit of 75 bushels (no prior limit)
Shellfish license moratorium; Lease production documentation required
2.5 inch size limit on coon oysters
5 bushel hand; 15 bushel dredge harvest limits
3-inch size limit on all coon oysters
Hurricane Isabel (flooding & high winds)
Oyster Rehabilitation Program expanded
Hurricane Alex (cente
off outer banks)
Oyster disease
Hurricane Irene (flooding & high winds)
Severe winter freeze
Hurricanes Dennis & Floyd (Heavy Flooding)
Hurricane Ginger
2.5 inch size limit on rock oysters
Shell-planting legislation
1894 estimated landings of 120,000 lbs
Hurricane damage
Winslow oyster bottom survey
Shellfish franchises authorized
1897 Depression
Shellfish leases began
World War I
Typhoid outbreak
Power dredging began
Great depression
1933 Storm
Heavy oyster mortaliity report
World War II
Heavy oyster mortality report

Disease and Redirection

- NC Shellfish Rehabilitation Program's focus was supporting a viable commercial harvest
- Epizootic infection by DERMO (*Perkinsis marinus*) in 1987 drove oyster management for the next 15 years
- Focus shifted from commercial production to rebuilding a devastated oyster stock
- Oyster's value as critical habitat and contributions to water quality recognized
- No harvest oyster sanctuaries, hatcheries, and introduction of non-native species considered
- Plans developed with input of government agencies, non government groups, and researchers (Blue Ribbon Council, DMF FMP, & NCCF Oyster Plan)

Implementation

- **Cultch Planting:** 150,000 – 300,000 bus. annually
- **Oyster Sanctuaries:**
  - 12 permitted ~ 228 acres ~138 acres developed
  - 3 funded and in process (design, permit, EA, etc.)

Cultch Planting

- Deployment of materials (shells or limestone marl) providing a hard substrate for oyster larval recruitment
- Statewide program – Roanoke Island to NC/SC border
- Modern era began in 1970 with dedicated staff and vessels
- Program has evolved and currently has 6 specialized vessels:
  - 2 small barges (32’ & 36’) designed for the small shallow estuaries south of White Oak River
  - 2 medium sized barges (50’ & 63’) designed for the bays and rivers around Pamlico Sound
  - 1 shallow draft barge with O/B power (40’) designed to reach areas inside the reef behind the outer banks and the shallow bays as needed
  - 1 converted surplus LCU (135’) operates in Pamlico Sound, deeper portions of rivers and bays

R/V Stones Bay and R/V Cape Fear
Wilmington, NC

R/V Crab Slough

Wanchese, NC

R/V Shell Point

South River, NC

M/V Jones Bay
South River, NC

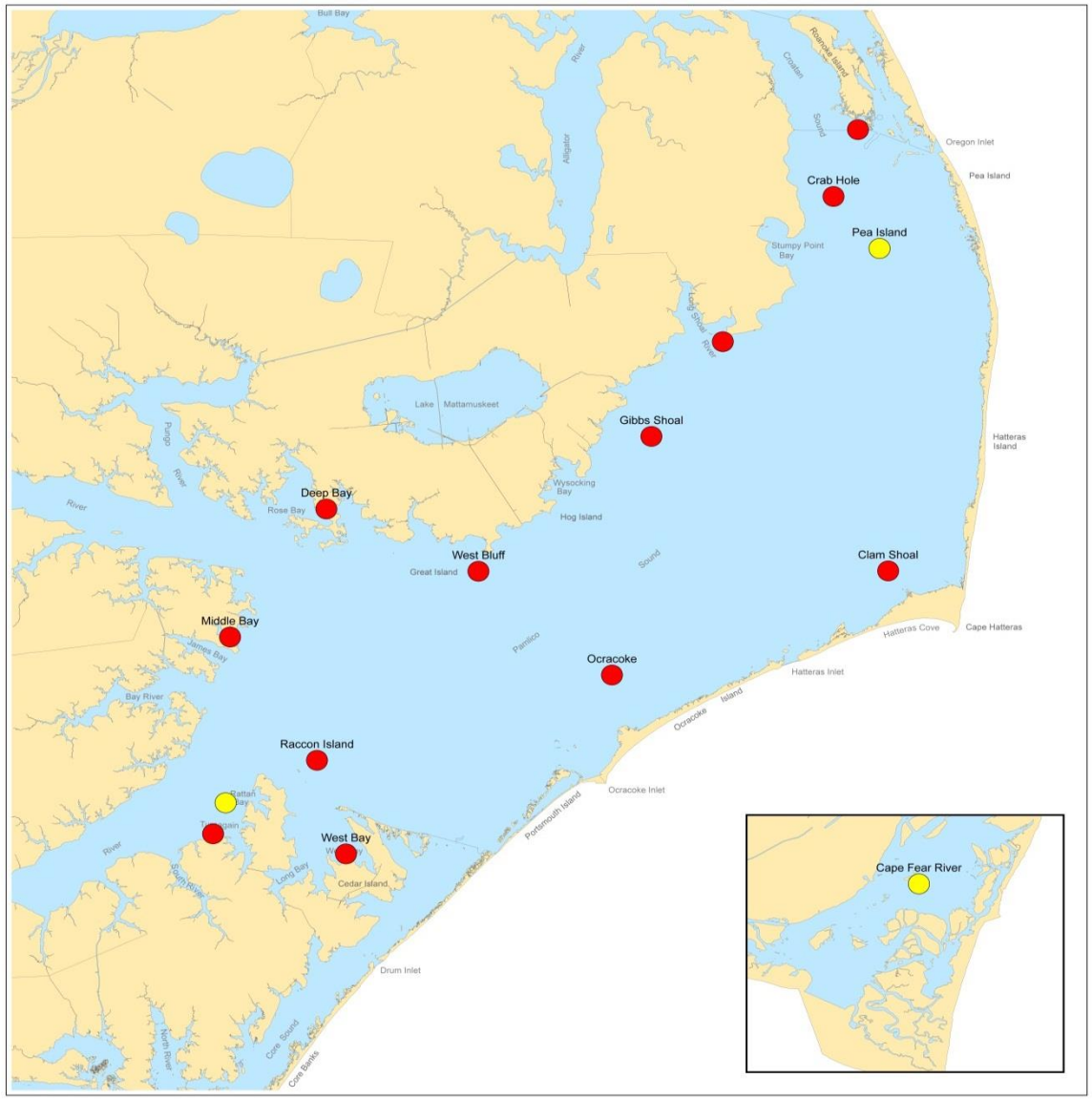
M/V West Bay
South River, NC

Cultch Planting

- Materials: cured shells and limestone marl
- Sampling: cultch planting sites for last 3 years
  - Recruitment
  - Growth
  - Survival
- Public Meetings – input for site selection
- Field investigations – broad area selection
- Broad area selections submitted to US Army Corps of Engineers and NC Division of Water Resources for permits
- Specific site selection based on criteria…bottom type, salinity, presence of oysters or SAV, historical oyster success
- Select appropriate cultch material, amount of material and vessel
- Planting record and maps submitted to USACOE and placed on the Marine Fisheries website

Oyster Sanctuaries

- Program began in 1996 in collaboration with UNC – IMS, DMF's Shellfish Rehabilitation and Artificial reef programs
- DMF has partnered with various state and federal agencies and NGO's (NOAA, TNC, NC DOT, NCCF, CWMTF, US Navy & APNEP)
- Primary function: is to provide a protected broodstock population in key locations that may provide oyster larvae to areas that will support settlement, growth and survival
- Site selections:
  - based on historical oyster presence
  - environmental conditions conducive to oyster recruitment, growth and spawning
  - larval distribution patterns – provide larvae to key areas



North Carolina Oyster Sanctuaries

Status (November 20, 2013)

- Exisiting (12)
- Proposed (3)

N

0 2.5 5 10 15 20 Miles

Cultch Planting 2013

- **~149,300 bushels statewide:**
  - 45,000 bushels limestone marl
  - 82,500 bushels purchased oyster shell
  - 21,800 bushels recycled oyster shells

Oyster Sanctuaries 2013

- **Gibbs Shoal:** CRFL funded 4 year – 30 acre project using limestone rip rap, ultra reef balls and reef cubes

- **West Bluff:** APNEP funded development project 1.3 acres using 10 ultra reef balls, 75 pallet reef balls, and 125 bay balls

- **Long Shoal:**
  - US Navy/TNC funded development of 5 acres as mitigation for reactivation of the Long Shoal Bombing Range using 880 ultra balls
  - TNC funded development of 1.5 acres using 264 ultra reef balls

Oyster Sanctuaries – in progress

- Raccoon Island: CRFL funded development project 10 acres using 1169 ultra reef balls, 150 tons of crushed concrete and 150 tons of concrete pipe (90% complete)

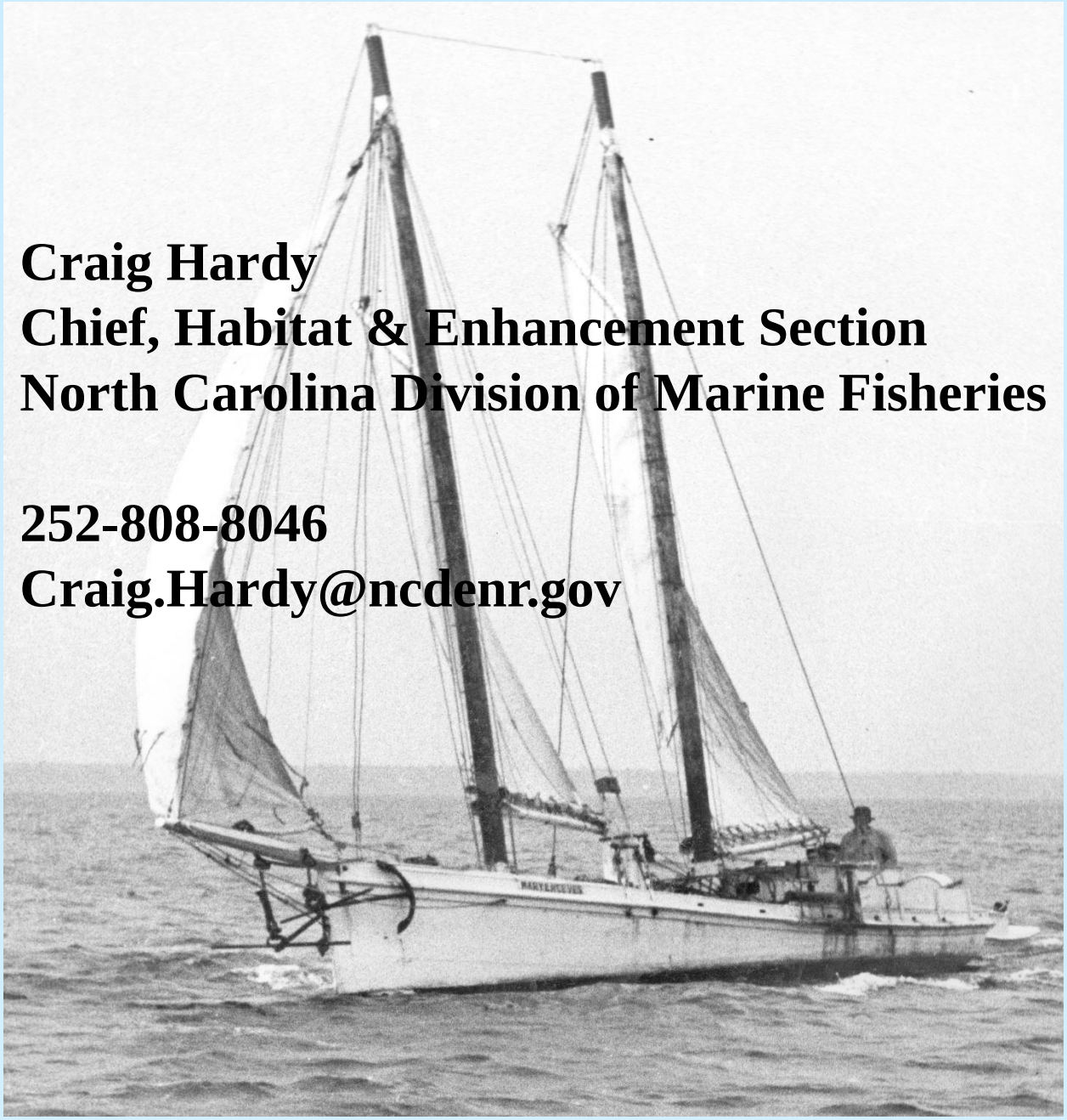
- Croatan Sound: DMF funded development project 1.5 additional acres of 7.7 acre site. Using 290 pallet reef balls

- Pea Island: CRFL funded development project 10 acres - in design phase

- Little Creek: US ACE funded development project - Environmental Assessment being developed

Management

- Oyster Fisheries Management Plan – 5 year review is starting
- Oyster season by Rule is October 15 to March 31, but is managed by proclamation
- Area restrictions for gear and harvest limits:
  - Upper portions of bays and smaller estuaries hand harvest only
  - Outer portion of bays mechanical is allowed for a six week period with harvest limit of 10 bushels per day
- Sampling is conducted in mechanical harvest areas throughout the season – samples must exceed 26% legal (3”) oysters
- Two consecutive samples under the 26% threshold closes the area. Sampling continues and the area can reopen with oyster growth.



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