# Managed wetland impoundments:
## history, distribution, management strategies for wildlife

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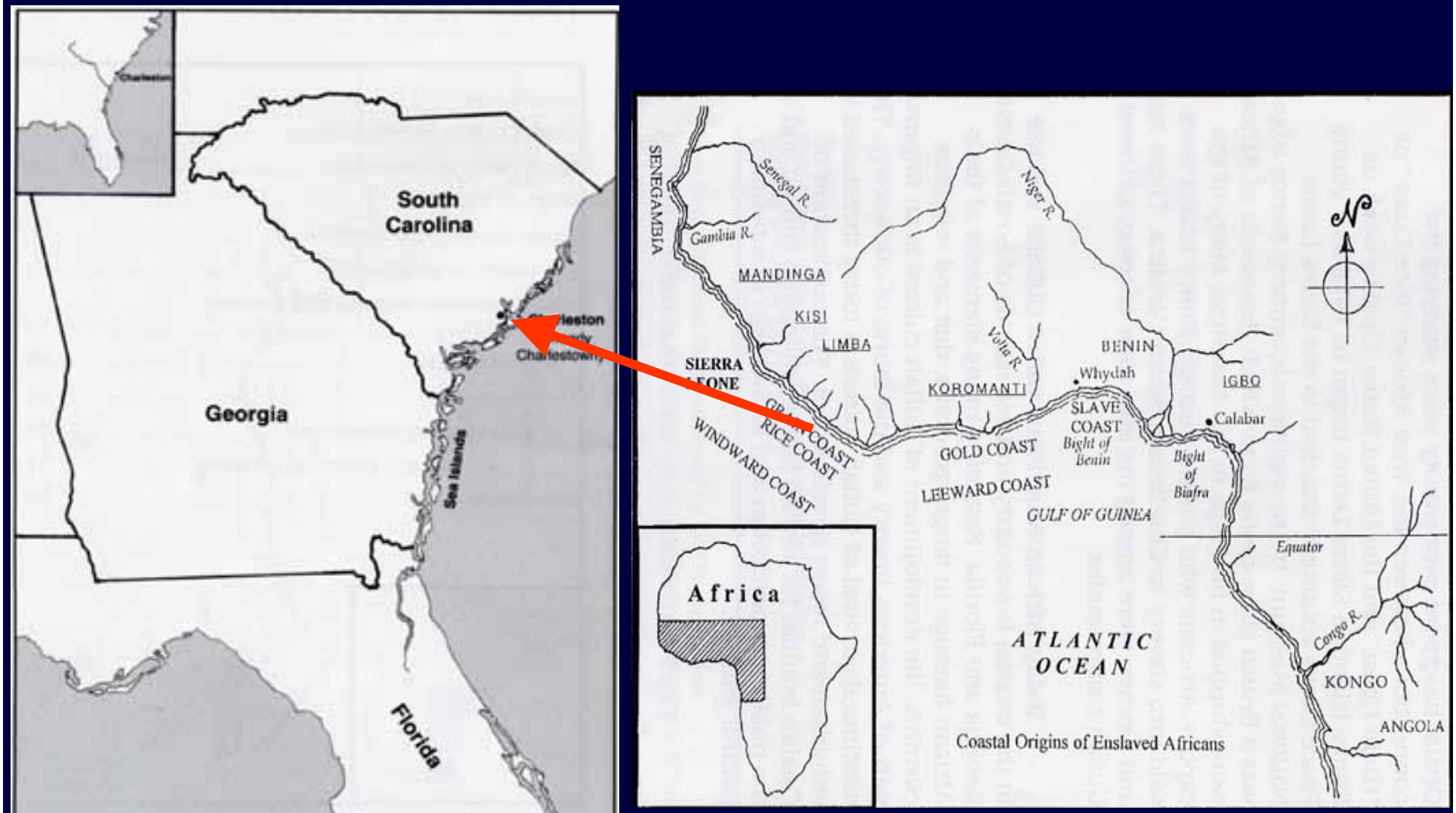
# Agrarian Rice Era in the South (primarily S.C.)

- Rice industry introduced ~1680–1685 (to Charleston)
- Cultivated uplands initially, then floodplains of inland swamps
- Small (<12 ha) impoundments
- Cleared cypress, gum, tupelo swamps
- Water from adjacent streams used for irrigation
- From mid- to late 1700s, cultivated freshwater, tidal zone (forested tidal swamps)
- Hand-built extensive system of dikes, canals, ditches, tide-operated, gravity-flow water control structures

# Agrarian Rice Era

- 1750, George Town (Georgetown) became center of rice production in British colony
- 1794, Charleston – wealthiest city among all former British Colonies
- 1840, Georgetown District (later County) produced ~½ total rice crop of U.S.
- 1850s – most profitable decade for rice planters
- ≥70,000 ac of tidal area cultivated for rice in S.C.
- ≥100,000 ac of tidal area from Cape Fear River, N.C. to St. Johns River, FL.




Joseph A. Opala

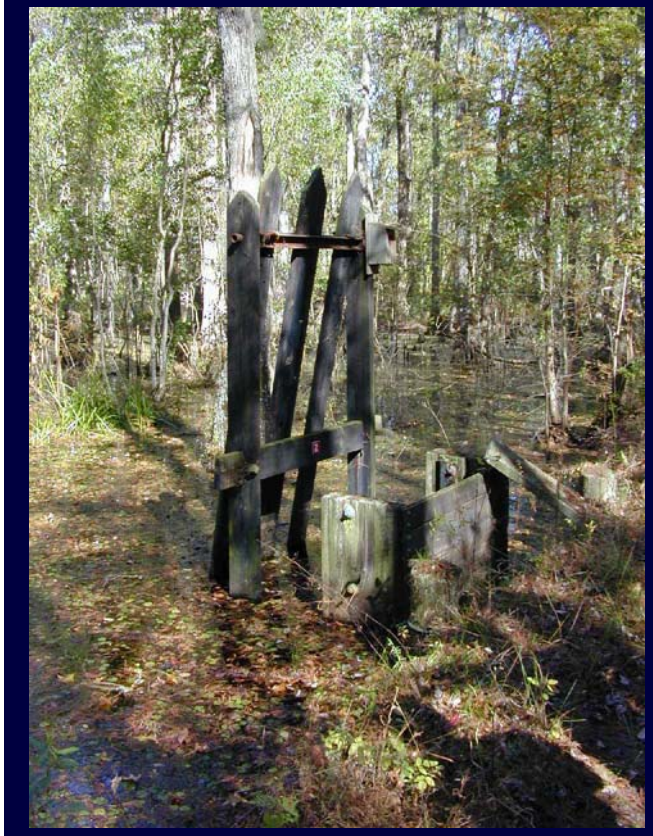
www.mansfieldplantation.com

www.gullahgal.com/education.htm

Hard, intensive labor

West African tidal rice cultivators

# Ricefield trunk



Former rice field at White Oak Plantation on the St. Marys River. Constructed by slaves in 1768 and farmed until the American Civil War; now part of White Oak Plantation (www.unf.edu/floridahistoryonline/Plantations/plantations/Rice_Cultivation.htm)

Photos: Merle Shepard

# Rice birds of the fields

# Era of rice plantations ended between 1870-1900

- Many hurricanes and tropical storms significantly damaged ditch, dike, water control systems
- Competition with rice production along Mississippi River (Arkansas, Louisiana, Texas)
- Civil War and end of slavery
- Dominance of cotton

# Post-Agrarian Rice Era (1890s to 1930s)

- Abandoned rice plantations purchased by wealthy
- Lands managed as waterfowl hunting grounds (clubs, lodges)
- Supplied freshwater to impoundments during growing seasons to propagate natural vegetation
- Kept impoundments flooded during hunting season
- 1950s to 1960s – wetland management improved; improved water control structures' sophistication
- More knowledge about needs of waterfowl

# Current Era . . .

- Plantation lands kept intact by private landowners, state & federal agencies, National Wildlife Refuge system
- Conservation Easements (TNC, DU, and state agencies)
- Important wintering habitat for waterfowl, wading birds, shorebirds, Larids, rails, bald eagles, osprey, pelicans, etc.
- S.C. winters ≥30% of dabbling ducks of Atlantic Flyway (teal, shovelers, mallards, pintails, wigeon, gadwall)
- SC & GA winter <100,000 diving ducks (~3%) of flyway (ring-necks, lesser scaup)

# Current Era . . .

- Impoundments present throughout tidal reaches of South Carolina's 5 major drainage basins:
  - Black-Waccamaw-PeeDee
  - North and South Santee
  - Wando-Cooper-Ashley
  - Ashepoo-Edisto-Combahee
  - Broad

Ray Ellis

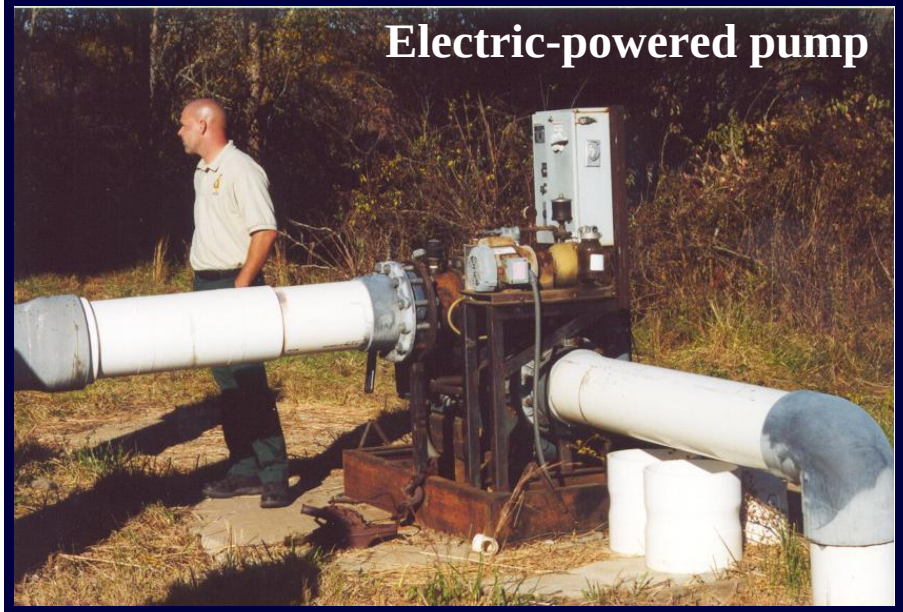
# Fresh water, tidal swamps

# Control of Water Levels

Metal gate and hand-wheel

Stop-log weir

Electric-powered pump



Ricefield trunk

# Greentree Reservoirs (GTRs)

Bottomland hardwood forests flooded during winter

- winter habitat for wood ducks, mallards, black ducks
- feed on mast
- cover from predation, weather, hunters
- nesting habitat for wood ducks
- marketable timber

# Greentree Reservoirs (GTRs)

- cherrybark oak (*Quercus falcata* var. *pagodaefolia*)
- willow oak (*Q. phellos*)
- nuttall oak (*Q. nuttalli*)
- laurel oak (*Q. hemisphaerica*)
- water oak (*Q. nigra*)
- overcup oak (*Q. lyrata*)
- white oak (*Q. alba*)

# Greentree Reservoirs (GTRs)

Other important mast-producing species –

- sweet gum
- black gum
- bald cypress
- ash
- elms
- box elder
- horn beams

# Greentree Reservoirs (GTRs)

Water management –

- raise water in fall (trees dormant), 1-18 inches (≤45 cm)
- remove water when leaf growth begins in spring; drain as thoroughly as possible
- do not flood annually – results in decline in
  - use by waterfowl
  - acorn production
  - forest growth
  - regeneration of desirable oak spp.

# Moist Soil Management

- Drawdown during growing season
- Propagate desirable waterfowl foods/forage
- Reflood in fall

# Moist Soil Management

Time & amount of water removed affects plant response

- Saturated soil - polygonums (smartweed, knotweeds); *Aneilema* spp.
- Standing water - *Zizaniopsis* sp. (giant cutgrass); cattails (*Typhus* spp.); bulrushes (*Scirpus* spp.)
- Unsaturated soils - panicgrass; giant foxtail; *Cyperus* spp.; can plant corn, millet, etc.