Shellfish restoration plans from other states: can we develop plans for Florida?
One sometimes overlooked context...

Calico scallop fishery: Peaked in 1984
2600* people involved in harvest and associated works (processing and logistics)
$23,000,000 direct;
$86,000,000 indirect value

Bay Scallops: commercial fishery peaked in 1950’s
100’s of jobs when it was a commercial fishery
$100,000 – $ millions / year / co. recreational

Hard Clams: early records of huge catches in Southwest Florida
1980’s and 1990’s: 1000 – 1200 clam fishers per day.
$8,000,000 / year in direct product value
Current aquaculture jobs 500+

Oysters: Franklin County: At a recent peak ~ 2015, ~ 2000 jobs
directly associated with oysters?

As early as 1917 the wholesale value was in the $10 - 20,000,000 / year range
Regional Plans for Oysters

GoM, GoM NRDA, MD/VA

Shellfish Management Plans

RI, DE, VA, NC*, TX τ, BC

Stock Assessments

ME, MA, NJ, MD*, VA, LA,

* - MD has plans for oysters and clams
* - NC has plans for clams, scallops, oysters
ψ - VA has local MP for some rivers
τ - TX had a plan in 1988

https://www.gsmfc.org/publications/GSMFC%20Number%20202.pdf
Natural Resources Damage Assessment

- Restore and Conserve Habitat.
- Restore Water Quality.
- Replenish and Protect Living Coastal and Marine Resources.
- Provide and Enhance Recreational Opportunities.
- Provide for Monitoring, Adaptive Management, and Administrative Oversight to Support Restoration Implementation.

https://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan
Restore and Conserve Habitat
Restore Water Quality and Quantity
Replenish and Protect Living Coastal and Marine Resources
Enhance Community Resilience
Restore and Revitalize the Gulf Economy

https://restorethegulf.gov/comprehensive-plan
Deepwater Horizon Oil Spill
Natural Resource Damage Assessment

Strategic Framework for Oyster Restoration Activities
June 2017

Programmatic Damage Assessment and Restoration Plan
Programmatic Environmental Impact Statement (PDARP/PEIS) by NRDA TIG

Summary
- Overview of injury
- Goals
- Restoration Approaches
- Monitoring

Biological Information
- Distribution
- Life history
- Threats

Ongoing
- Conservation
- Restoration
- Management
- Monitoring

Prioritization and Selection
- Approaches
- Techniques
- Potential Project Concepts
- Monitoring needs

Deepwater Horizon Oil Spill
Natural Resource Damage Assessment

Strategic Framework for Oyster Restoration Activities
June 2017

Programmatic Damage Assessment and Restoration Plan
Programmatic Environmental Impact Statement
(PDARP/PEIS) by NRDA TIG

Summary
Overview of injury

Goals
Restore spawning stock sufficient for healthy recruitment
Restore resilience
Restore a diversity of habitats

Restoration Approaches
Monitoring

Biological Information
Distribution
Life history
Threats

Ongoing
Conservation
Restoration
Management
Monitoring

Prioritization and Selection
Approaches
Techniques
Potential Project Concepts
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Deepwater Horizon Oil Spill
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June 2017

Programmatic Damage Assessment and Restoration Plan
Programmatic Environmental Impact Statement (PDARP/PEIS) by NRDA TIG

Summary
- Overview of injury
- Goals

Restoration Approaches
- Restore or create reefs
- Construct living shorelines
- Enhance productivity
- Develop a network or reserves

And supporting activities
- Establish shell recycling
- Enhance regional hatchery capacity
- Foster oyster gardening
- Build partnerships

Monitoring

Biological Information
- Distribution
- Life history
- Threats

Ongoing
- Conservation
- Restoration
- Management
- Monitoring

Prioritization and Selection
- Approaches
- Techniques
- Potential Project Concepts
- Monitoring needs
Chesapeake Bay Oyster Recovery: Native Oyster Restoration Master Plan
Maryland and Virginia

SEPTEMBER 2012

Prepared by
U.S. Army Corps of Engineers
Baltimore and Norfolk Districts

So what’s in the Chesapeake Restoration Plan?
A vast majority of what is included is a comprehensive overview of the available information about a species.

Overview: need and ongoing efforts
Problem Identification
Vision: goals and objectives
Existing Conditions
Plan
Recommendations
Adaptive Management
Monitoring Needs
Agency and Public Coordination
Conclusions
So what’s in the Chesapeake Restoration Plan?
A vast majority of what is included is a comprehensive overview of the available information about a species.

Overview: need and ongoing efforts
Problem Identification
  Loss of habitat
  Disease
  Water Quality Degradation
  Overharvest
Vision: goals and objectives
Existing Conditions
Plan
Recommendations
Adaptive Management
Monitoring Needs
Agency and Public Coordination
Conclusions
So what’s in the Chesapeake Restoration Plan?
A vast majority of what is included is a comprehensive overview of the available information about a species.

Overview: need and ongoing efforts
Problem Identification
Vision: goals and objectives
  Restore self-sustaining oyster sanctuaries
  In low salinity areas restore habitat, larval transport connections
  In high salinity areas restore and maintain habitat
  Restore resilience
  Create a network over the whole salinity range
  Build reefs that support diversity and sequester nutrients
  Create sanctuaries for larval supply in multiple estuaries

Existing Conditions
Plan
Recommendations
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So what’s in the Chesapeake Restoration Plan?
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Overview: need and ongoing efforts
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Vision: goals and objectives
Existing Conditions
Plan

Recommendations
Survey individual estuaries: bottom, density, larval model, settlement
Reef designs: morphology, fragmentation, topography, flow, depth, nearest neighbors, predator exclusion, poaching deterrent
Identify local sponsors
Identify research needs

Adaptive Management
Monitoring Needs
Agency and Public Coordination
Conclusions
So what’s in the Chesapeake Restoration Plan?
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Overview: need and ongoing efforts
Problem Identification
Vision: goals and objectives
Existing Conditions
Plan
Recommendations

Adaptive Management (success criteria / metrics)
  - Survival rates
  - Density & fecundity
  - Settlement
  - Substrate / reef accretion
  - Growth rates
  - Disease (for selective stocks and seed source?)

Monitoring Needs
Agency and Public Coordination
Conclusions
Practitioners Guide

Introduction

Making the case for restoration

Plans, Goals and Feasibility

Biosecurity and Permitting

Practical considerations and techniques

Scaling up

Monitoring

Other Shellfish?

Communication

Two states with actual Shellfish Management plans

Rhode Island

Delaware

So what’s in some state’s Shellfish Management Plans?
A vast majority of what is included is a comprehensive overview of the available information about a species.

**Rhode Island**

- 200+ participants
- Ecology of RI
- Biology of Shellfish
- Overview of Harvest and Aquaculture
- Stock Assessment
- Economic Assessment
- Human Health overview
- Risks
- Rules
- Conclusion
- Recommendations

**Appendix:**
- History of fishery
- Stakeholder concerns
- Available commercial infrastructure
- Water quality and open/closed areas
- Market analysis
- Principals, Vision, Goals, Objectives

**Delaware**

- Technical Advisory Committee
- Overview of Species
- Conservation Strategies
- Culture Methods
- Stock Enhancement Options
- Commercial Options
- Management Perspectives
- Policy
- Funding Sources
- Inventory of ongoing projects

**Appendix:**
- History of fishery
- Stakeholder concerns
- Available commercial infrastructure
- Water quality and open/closed areas
- Market analysis
- Principals, Vision, Goals, Objectives
Goals
Introduction
Authority
Problem
Management Unit
Plans and Rules
Stock Status
Fishery Status

Protected Species Interactions
Aquaculture and Stock Enhancement
Socioeconomic Aspects
Environmental Factors
Management Options
Recommendations
Appendices (supporting documents and studies)
Summary

Restoration Plans and Management Plans have broadly similar structure

Identify a problem
Lots of information about status, biology, rules, etc.
Set Goals
Methods
Define Risks
Recommendations and / or Conclusions