Alternative Uses of Aquaculture: Replenishing Depleted Fisheries

SCORE

SCIENCE CONSORTIUM FOR OCEAN REPLENISHMENT

Ken Leber

MOTE MARINE LABORATORY

Science Consortium for Ocean Replenishment

Potential of Flounder Enhancement

Ecosystem-based blue crab enhancement in the Chesapeake Bay

Restore spawning stock and recruitment

Protect and restore critical nursery habitats

Community-based management/Education

Crab enhancement in nurseries

Multi-species management

(Rom Lipscius, Virginia Institute of Marine Science)

Enhancing Saltwater Sport Fisheries

Example – Florida: “Snook Fishing Capital of the World”

Snook contribute to Florida’s $5.1 billion saltwater recreational fishing industry




Snook are Threatened by:

- Rapid Population Growth
- Cold Winter Freezes
- Red Tides

Florida Fish & Wildlife's new statewide replenishment initiative

Science Consortium for Ocean Replenishment

http://www.supportfloridasportfish.com/

Google

FLORIDA'S SALTWATER HATCHERY & HABITAT INITIATIVE

A Partnership to Ensure More Recreational Fishing Opportunities in Florida, Today and Tomorrow Through Sound Management Practices.

Welcome

Wildlife Foundation of Florida
ESTABLISHED | 1994

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Florida Fish & Wildlife's new statewide replenishment initiative

Science Consortium for Ocean Replenishment

http://www.supportfloridasportfish.com/indoor_facility.html

FLORIDA'S SALTWATER HATCHERY & HABITAT INITIATIVE

- About The Initiative
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LEARN MORE ABOUT THE SALTWATER HATCHERY & HABITAT INITIATIVE

JOIN THE FLORIDA HATCHERY AND HABITAT ONLINE ADVISORY PANEL

INTENSIVE RECIRCULATING AQUACULTURE SYSTEM (RAS)

THE MODEL FOR SMALLER INDOOR FACILITIES


Red Drum Embryo


Grow-Out Tanks


Transport Truck


Red Drum Releases


40 Tank RAS System and 20 Tank RAS System

FWC is working with hatchery network partners to pursue the development of indoor Re-circulating Aquaculture Systems (RAS) for raising marine sportfish to larger sizes before release. Intensive re-circulating systems use an integrated water treatment process that allows most of the water used in aquaculture operations to be reconditioned and recycled. One of the major advantages of RAS technology is a smaller facility footprint that requires less land and can be built away from the coast.

This project has great promise to become a model for public-private partnerships and change the way diverse parties work as a team toward environmentally responsible and beneficial solutions-but we need your help to make it happen.

Businesses, civic organizations, sporting clubs and associations, communities, schools and concerned individuals must all become-and remain-actively involved.

We are actively searching for site locations. No fixed size is required, so if you know of a location that might work, please telephone 800-988-4889 or e-mail, info@supportfloridasportfish.com

Please take a few minutes to register to BE PART OF THE TEAM and help us sustain fish, their habitats and sport fishing for future generations to enjoy.

Phone: 800 - 988 - 4889

A Partnership to Ensure More Recreational Fishing Opportunities in Florida, Today and Tomorrow Through Sound Management Practices.

myfwc.com

WILDLIFE FOUNDATION OF FLORIDA

A Responsible Approach to Marine Stock Enhancement *

Stay Within Context of Fisheries Management Plan:

1. **Prioritize Species for Enhancement**
2. **Stocking Plan integrated with Fishery Management Plan**

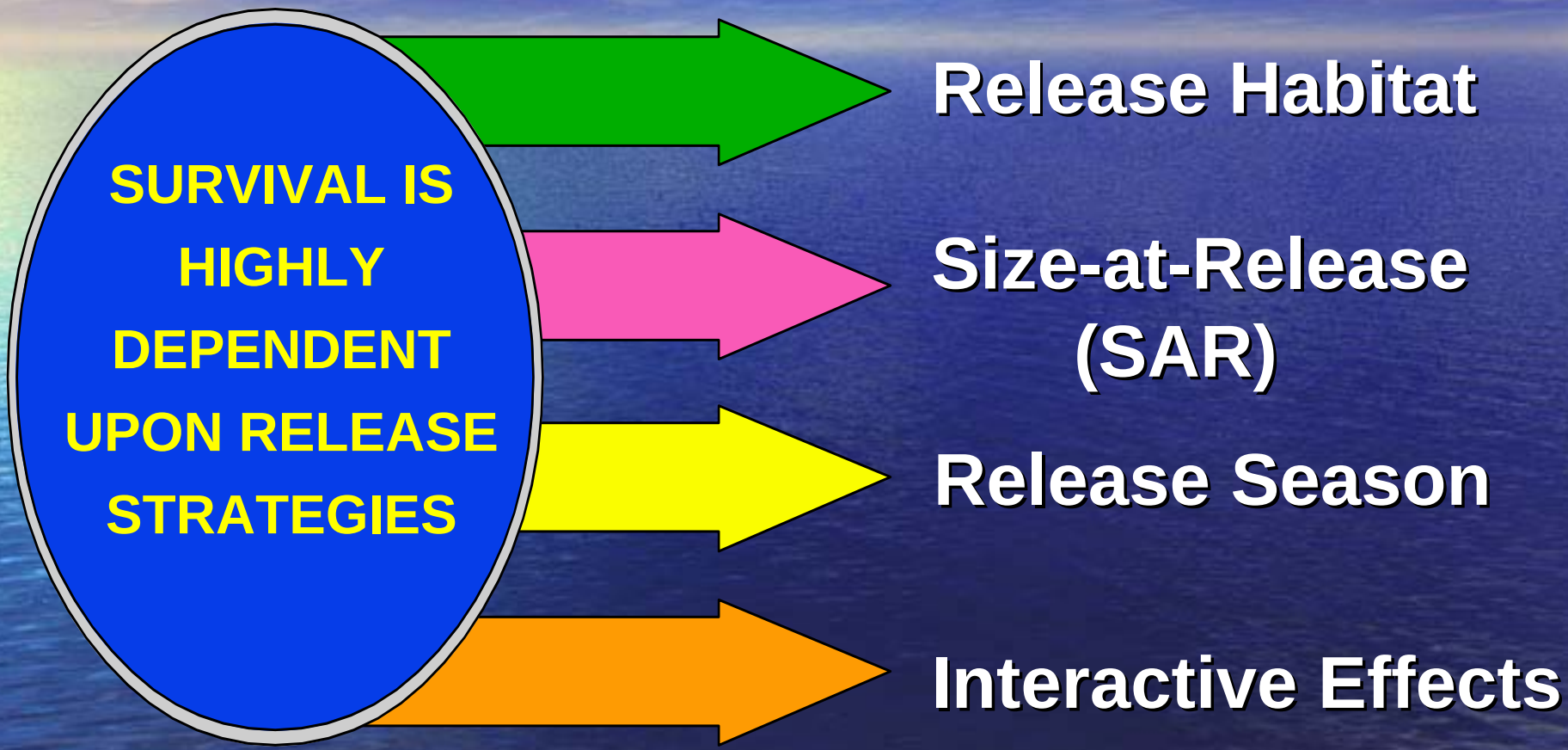
Develop Sound Enhancement Strategy:

3. **Quantitative Measures of Success**
4. **Genetic Resource Mgmt. to Prevent Deleterious Effects**
5. **Disease and Health Management**
6. **Know Ecological, Biological, & Life-History Patterns**
7. **Identify Hatchery Fish & Assess Stocking Effects**
8. **Define Optimal Release Strategies**
9. **Policy Guidelines & Economic Impact**
10. **Use Adaptive Management**

(* Blankenship & Leber, 1995)

www.StockEnhancement.org/science/publications.html

Rationale for Pilot Studies to Optimize Release Protocol



Hypothesis:

Marine Hatchery Releases Increase Fish Abundance

Predictions:

- Cultured Organisms Can Survive, Grow & Contribute to Fisheries ✓
- Stocked Organisms Do Not Displace Wild Individuals ?
- Stocking to Increase Fishery Production is Economical ?


Science Consortium for Ocean Replenishment
Mote Aquaculture Park
200 acre site, 17 miles inland
Commercial & Research Scale Marine and Freshwater Facilities
Focus on developing zero discharge technologies

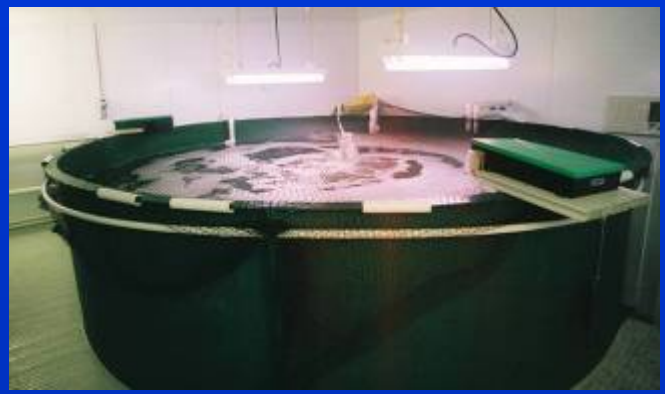
Fingerling Production Facilities

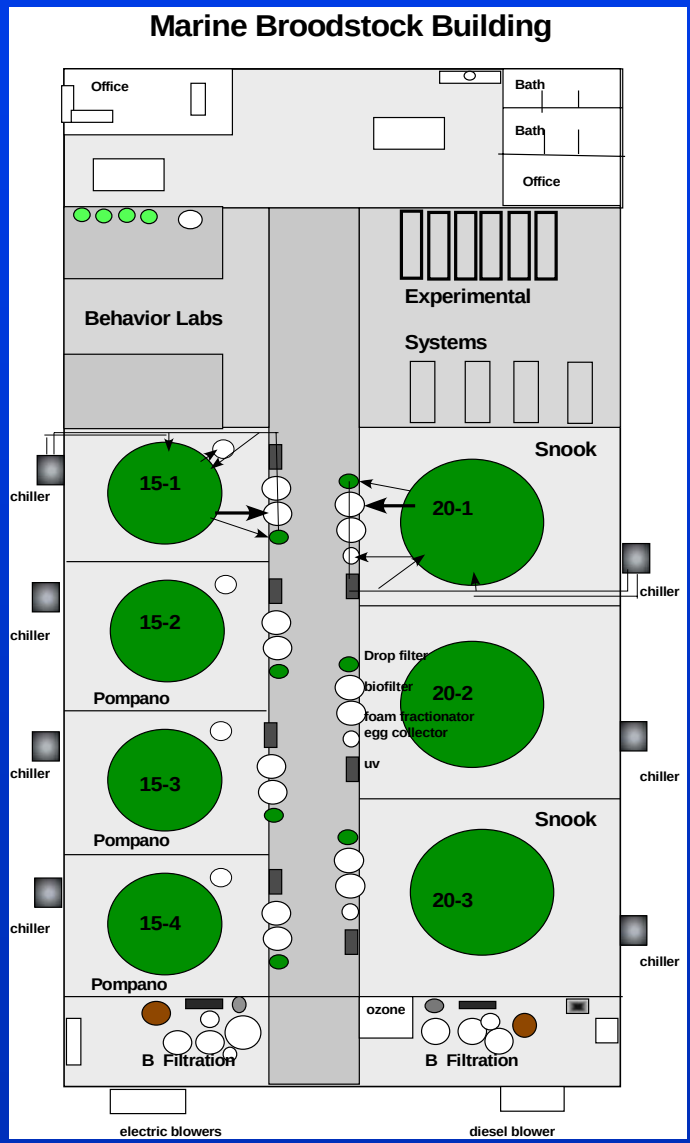
Large-scale Growout Tanks

Low-Head/Low-Energy Filtration System

Marine Fish Breeding Systems

- Large breeding tanks
- Independent temperature, lighting and filtration





www.StockEnhancement.org

http://www.stockenhancement.org/index.html

SCORE
SCIENCE CONSORTIUM FOR OCEAN REPLENISHMENT

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SCORE Consortium

- Mote Marine Laboratory
- NMFS NW Fisheries Science Center
- University of New Hampshire
- University of Southern Mississippi

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Probing the Potential of Marine Stock Enhancement

The Science Consortium for Ocean Replenishment (SCORE) is developing responsible, effective, and scientifically-based marine stock enhancement & restocking technologies. The consortium is a multi-state US initiative to help boost recovery of depleted fisheries.

What is stock enhancement?
The fish and invertebrates that support coastal fisheries are among our Nation's most important natural resources. Sustaining these is much more challenging today than in the past. Stock enhancement entails releasing hatchery-reared juveniles into the wild to augment the natural supply of juveniles and help optimize fishery harvests.

But the effectiveness of stocking is not well understood and techniques for ensuring success have not been developed. To realize the potential of stock enhancement to rapidly replenish fish stocks, better science is needed about stocking juveniles into the sea.

SCORE is conducting the research needed to make stocking effective . The goal is to develop stocking into an economical, environmentally friendly fishery management strategy to be used, when appropriate, along with fishing regulations and habitat protection.

Managing Stocking Effect on Fisheries

Hatchery snook in Gulf Coast fishery >>More

Hatchery Reform
Scientific Review Group in action... >>More

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Florida's model program for integrating aquaculture into fisheries management

- Promoting sustainable stocking practices
  - Regulatory incentives:
    - Genetic guidelines policy (& permit clause)
    - Health guidelines policy (& permit clause)
    - Stocking guidelines (adaptive management)
  - Market incentives:
    - Funding for Eco-Centers (joint fundraising effort)
    - Funding for zero-discharge research (FL, NOAA)
  - Management incentives:
    - Stakeholder involvement in planning
    - Strategic integration of stocking with fishery management; responsible approach

Sponsors & SCORE Partners

Mote Scientific Foundation