



Restoration History Of Anitra Thorhaug, Phd.

1.) FIRST LARGE SCALE SEAGRASS RESTORATION. Nuclear Power Plant. Turkey Point, Biscayne Bay, Florida after the plant went to an alternate cooling system

2.) SEAGRASS RESTORATION in USA, Southeast Asia, Caribbean nations, and African nations such as Kenya, Egypt, Guinea Bissau, Equatorial Guinea, and others. Restoration consultant to United Nations FAO, IOC, UNDP, UNEP. also to individual nations such as Jamaica, Bahamas, St. Lucia, Trinidad, Philippines, Malaysia, Singapore, Indonesia, Papua New Guinea, the Marshall Islands, the Netherlands, Spain, and Romania.

3.) PLANNING, ASSESSMENT AND/OR MITIGATION FOR

OTHER POWER PLANTS: Anclote Power Plant, Anclote, Florida; Hutchison Island Nuclear Power Plant, Hutchison Island, Florida; Tampa Bay. (see below in 4. for multiple power plants in Mombasa, Kenya, Equatorial Guinea, Philippines, Guinea Bissau, Limay, Bataan, and Guayanilla Bay, Puerto Rico.)

4) PLANNING AND/OR EXECUTION FOR SEAGRASS

RESTORATION WITH A SERIES OF INFRASTRUCTURE

PROJECTS:

- a.) Port of Miami, Port Expansion Phases I, II, and III. Largest port in Southern USA, and 2nd largest in USA (1978-9)
- b.) Sewer Pipelines across Biscayne Bay, Fl. Miami Dade Water and Sewer Authority
- c.) Rickenbacker Causeway Authority, Biscayne Bay, Fl.
- d.) Channel dredging, Biscayne Bay, Fl.
- e.) Mitigation for sewerage effluents, Kingston, Jamaica,
- f.) Mitigation for sewage, Montego Bay, Jamaica
- g.) Mitigation for sewage effluent, Manila Bay, Philippines.
- h.) Mitigation for airport, Port Royal, Jamaica
- g.) Migration for Free Port, Montego Bay, Jamaica
- h.) Mitigation for dredged Beaches, Montego Bay Jamaica
- i.) Mitigation for Port Esquivel, May Penn, Jamaica
- j.) Mitigation for Port of Mombasa, Mombasa , Kenya
- l.) Mitigation for gas and oil refineries, drilling and expansion of power plant, and Port of Malabo, Equatorial Guinea.
- m.) Mitigation planning and assessment for five power plants and expansion of oil ports for Guinea Bissau.
- n.) Homestead (Florida) Marina. Mitigation.
- o.) Watson Island Heliport. Survey. Design with engineers for permit.

- p.) Plaza Venetia Marina. Consultant to environmental groups.
- q.) Captiva Marina. Mitigation planning for canal malfunction.
- r.) U.S. Army Corps Dredge Island. Consultant to Corps Waterway Sta. mitigation on dredge islands.
- s.) Florida Keys Water Authority Pipeline. Water pipeline (150 mi). EIA. Survey. Mitigation plan. Restoration.
- t.) Florida Keys Bridges (38 bridges) . Consultant to Fla. Department of Environmental Resources and US National Marine Fisheries on bridges and its biological mitigation
- u.) Fort Augusta Causeway (Jamaica) Mitigation and biological survey
- v.) Sea Grant survey. Impact of dredge and fill on benthic vegetation in Biscayne Bay and Florida Keys.
- w.) Fort Augusta Causeway. Mitigation and survey.

5.) PLANNING AND/OR ASSESSMENT AND RESTORATION FOR INDUSTRIAL SPILLS.

- a.) Assessment and Mitigation planning for GULF WAR I. Kuwait, Iran, Saudi Arabia, Qatar, United Arab Emirates, Oman, Iraq.
- b.) Assessment and mitigation planning for Guayanilla Bay spill, Puerto Rico.
- c.) Assessment and mitigation planning for Port Esquivel oil spill, May Penn, Jamaica.
- d.) Assessment and mitigation planning for Marinduque Bauxite spill, Philippines
- e.) Assessment and mitigation planning for Mombasa Oil Spill, Mombasa , Kenya.
- f.) Mitigation for oil spill at Port Everglades, Ft. Lauderdale , Florida

- g.) Mitigation for oil spill at Jacksonville Port Authority, Florida (five locations)
- h.) Mitigation for oil spill at Port of Miami, Florida (three locations).
- il) Mitigation for fertilizer plant spill , Limay Baatan, Philippines.

6.) RESTORATION AND PLANNING FOR SHIP AND VESSEL

ACCIDENTS including

- a.) Fina Gas and Oil Company (USA) . Laguna Madre. 78 acres of seagrass. planning for mitigation, and execution. 2 propeller scars: 35 acres, and 26 acres (15 years prior)
- b.) Melvin Fisher, Salvors, Inc ship accident of "blowing out" over protected bottom several acres of seagrass. Planning for mitigation. Expert witness
- c.) Michael Construction Company. Big Torch Key. planning for restoration. Expert Witness.
- d.) Biscayne Bay propeller scar with FDEP management funding.

7.) RESTORATION OF SPECIES OTHER THAN SEAGRASS

Mangrove Restoration: USA, Jamaica, Bahamas, Puerto Rico, Columbia, Venezuela,
East and West Africa

Marsh Restoration: USA, Caribbean, Philippines

Coral Restoration: USA, Caribbean

8.) REGIONAL STUDIES:

Florida Keys. Environmental Impact Study of Future Development for Florida State Community Affairs (with Dr. J. Marcus)

Biscayne Bay. Organized and chaired three workshops and book on impact of development on natural resources.

Jamaica. Survey for mitigation of seagrasses of Island for Jamaican Government. Regional model.

Egypt. Coastal pollution survey, Mediterranean and Red Sea coasts. U.S. AID and Egyptian Environmental Ministry.

Philippines. Coastal pollution of seagrasses, FAO regional model.

Bahamas. Seagrass mapping, UNEP regional model.

Wrote specifications for Seagrass and Mangrove restoration for Guidebook on Environmental assessment for all projects of the World Bank.

9.) TOXICITY TESTING:

U.S. Environmental Protection Agency

U.S. Dept. of Energy

Florida Power & Light Company

Florida Power Corp.

Applied Biology

Mobil Oil Foundation, Inc.

US AID

Philippine Government

Jamaican Government

10.) ASSESSMENT AND TESTING OF OFF-SHORE FACILITIES:

OTEC. On team of environmental planners for OTEC (DOE).

Hawaii. OTEC studies and site visit.

Puerto Rico. OTEC studies.

Testing of materials. Fouling studies

11.) REAL ESTATE WATERFRONT DEVELOPMENTS:

Plantation Lakes Estates, Florida Keys

Lyford Cay, Bahamas

Ocean Reef Shores, Miami, Florida

Sandpiper Village, Cayman Is.

Richard Rose, Inc. Florida Keys, Miami Beach

Golden Glades, Naples, Florida

Marco Island , Florida (revegetation of canal berm)

Dolphin Cove (Lucea, Hanover) Jamaica.

12.) MINING ASSESSMENTS FOR SPILLS AND FACILITIES AND MITIGATION :

Ocho Rios Bauxite plant. Jamaica. Mitigation and survey.

Discovery Bay bauxite plant. Jamaica. Mitigation and survey.

Port Esquivel Bauxite loading plant. Jamaica. Mitigation and survey.

Rocky Point bauxite loading plant. Jamaica. Mitigation and survey.

Phosphate mining facilities South Red Sea Coast, Egypt. Survey.

Copper tailings. Marcopper, Ltd. Marinduque, Philippines. Impact/Mitigation.

Reports and publications of specific projects available if client consents upon request.