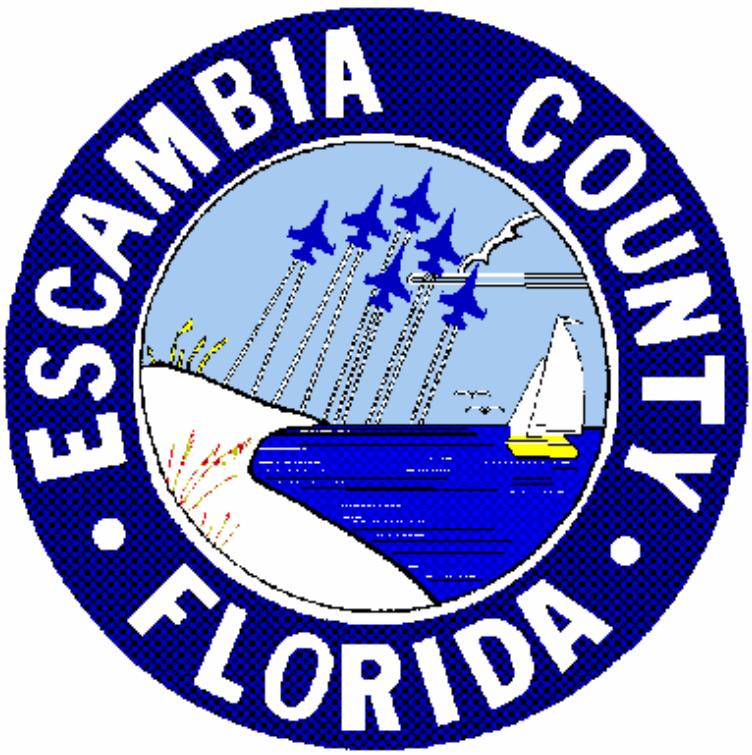
Escambia County Artificial Reef Plan



Escambia County Division of Marine Resources

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I. Introduction

Artificial reefs have been constructed in the marine (Gulf of Mexico) and estuarine (Pensacola Bay System, including Santa Rosa Sound, Big Lagoon, and Perdido Bay) waters of Escambia County, Florida for at least four decades (Turpin, personal observation). Initially and primarily, commercial and charter fishing/diving captains, and serious recreational fishers and divers constructed artificial reefs for the purposes of increasing fishing and diving locations. Historically, although relevant laws existed (e.g., Rivers and Harbors Act), artificial reef construction was not regulated. Most artificial reef materials consisted of "materials of opportunity" (e.g., automobile bodies and tires, boat hulls, household appliances, and other "scrap" materials). These materials were placed on the seafloor at locations decided upon by the individual reef builders; locations of these "private" artificial reefs were kept secret to maintain control over the harvest of fishes from each artificial reef.

Gradually, regulatory agencies such as Florida Department of Natural Resources and Florida Department of Environmental Regulation (now Florida Fish and Wildlife Conservation Commission and Florida Department of Environmental Protection), US Army Corps of Engineers, and US Coast Guard (USCG) began enforcing federal and Florida laws relating to artificial reef construction. Federal regulations include: Rivers and Harbors Act; and Clean Water Act. Florida regulations include: Florida Statutes and Florida Administrative Code.

In Florida waters (within 9 nautical miles from shore), permits from Florida Department of Environmental Protection (FDEP) and US Army Corps of Engineers (ACOE) are required for the construction of artificial reefs. In addition, Florida Sovereignty Submerged Lands issues may need to be resolved. In federal waters (9-200 nautical miles from shore), an ACOE permit is required for artificial reef construction. Florida Fish and Wildlife Conservation Commission (FWCC) Bureau of Marine Fisheries Management manages Florida's Artificial Reef Program. As governmental managers and regulatory authorities became more involved and interested in artificial reef programs and permitting, artificial reef materials became more restrictive. Justifications for increased scrutiny and restriction of artificial reef materials can be summarized as: 1) protection of the marine environment; 2) reduction of negative impacts of artificial reef materials to other marine resource uses (oil and gas extraction, trawl fisheries, beach restoration sediment sources); 3) reduce potential of artificial reef materials to wash ashore during storms; and, 4) provide long term marine life habitat instead of short term fish aggregation. Moreover, when public funds are expended for artificial reef construction, managers strive for the best possible (monetary) "value" by requiring durable and stable artificial reef materials.

Escambia County's participation in public artificial reef construction began in the 1970's with the deployment of the "Casino Rubble", "Three Barges", and "Liberty Ship" artificial reefs. In the mid-1980's, a Marine Recreation Committee was formed by the Escambia County Board of County Commissioners (BCC) for the purpose of artificial reef development and other boating- related issues. The Marine Recreation Committee

obtained permits for five artificial reef sites (Sites: 7, 15, 20, 21, 22), and constructed over 100 artificial reefs. In 1999, during permit renewal proceedings, it was discovered that a number of artificial reefs may have been deployed outside of the permit areas. Escambia County was issued a request for additional information. No response was provided by the County, therefore the permits expired without reauthorization.

In April 2000, the Escambia County BOCC established the Escambia County Division of Marine Resources (ECDMR) for the purpose of local management of marine, estuarine, and freshwater resources. Re-establishment of an Escambia County Artificial Reef Program has been identified as a major goal of ECDMR.

This Escambia County Artificial Reef Plan (Plan) is established as a guidance document and planning tool for the implementation of the Escambia County Artificial Reef Program (Program) and the construction of public artificial reefs. The goals set forth in the Florida Artificial Reef Plan and National Artificial Reed Plan have been combined and modified into Guiding Principles of the Escambia County Artificial Reef Program: ***Resource Protection and Enhancement; Resource Access; and Safety.***

Program Goals include:

1. enhance the (primarily sand) seafloor of the marine and estuarine waters of, and adjacent to, Escambia County by the placement of stable and durable artificial reef materials for the purpose of creating habitat for reef-associated species of fishes and invertebrates
2. increase regional abundance of marine life species
3. reduce negative impacts to natural reefs
4. provide fishing and diving opportunities for the residents and tourists of Escambia County
5. increase fishing and diving success, and artificial reef-user satisfaction
6. reduce conflicts between artificial reef users and user groups
7. increase safety of boaters using artificial reefs via establishment of artificial reef permits close to shore
8. increase fuel economy (decrease fuel consumption) via establishment of artificial reef permits close to shore
9. attain, at a minimum, 1995 (Pre-hurricane) ratio of artificial reefs : registered boats (in Escambia County)

II. Artificial Reef Sites

As previously stated, Escambia County's permits for the construction of artificial reefs have expired. However, in 1994 FDEP obtained an ACOE permit for "Large Area Artificial Reef Sites (LAARS) in the Gulf of Mexico. Two areas, "Escambia East" and "Escambia West" are located southeast and southwest, respectively, of Pensacola Pass. Although the LAARS were originally intended for the construction of "private" artificial reefs by commercial and charter fishing/diving operators, as well as serious recreational fishers and divers, Escambia County continues to utilize the LAARS for public artificial reef construction.

However, it is the goal of ECDMR to re-authorize some or all of the expired artificial reef permits, as well as permit new areas for artificial reef construction. Guiding principles for the establishment of new permits includes:

- proximity to Pensacola Pass
- seafloor characteristics (depth, sediment type, existing natural and artificial reefs)
- location of shipping lanes and anchorage areas
- jurisdictional issues (e.g., Gulf Islands National Seashore, Aquatic Preserve)
- Federal, state, and local laws
- SCUBA Training standards

Before ACOE will consider reauthorization of any of Escambia County's previously permitted artificial reef sites, thorough investigation of the existing artificial reef materials within- or intended to have been placed within- those sites must be performed. It is the responsibility of ECDMR to perform those investigations and report findings to ACOE.

Florida Department of Environmental Protection and US Army Corps of Engineers are the authoritative agencies governing artificial reef deployment. Escambia County must obtain permits from these two agencies for artificial reef deployment areas. These agencies have numerous regulations regarding reef site and materials. In addition, US Coast Guard, US Fish and Wildlife Service, National Marine Fisheries Service, and National Parks Service have various regulations and authority to prohibit artificial reef deployments in certain areas, particularly within Pensacola Bay and within three miles of the barrier islands in the Gulf of Mexico.

ECDMR plans to submit the following Artificial Reef Permit applications in Fiscal Year 2007-2008:

1. Renew Escambia East LAARS for public reef deployments (Application submitted February 2007)
2. Renew, Expand and Modify Esacambia West LAARS for personal reef deployments
3. Combine and expand Site 7 and Site 15 for public reef deployments
4. Submit application for new Escambia #3 LAARS
5. Submit application for Nearshore Fishing Reef
6. Submit application for Dive Training Reef
7. Submit application for Snorkeling Reef

III. Artificial Reef Materials and Construction

Permits for the construction of public artificial reefs contain criteria for allowable artificial reef materials; thus, permit criteria will be the primary guidelines for artificial reef construction under this Program. Numerous works have been published for the purpose of providing guidance for artificial reef construction and the selection of artificial reef materials (i.e., Guidelines for Marine Artificial Reef Materials; Coastal Artificial Reef Planning Guide; Florida Artificial Reef Plan; National Artificial Reef Plan).

The primary factors of consideration in the selection of public artificial reef materials include:

- Permit criteria
- Compatibility with marine environment
- Material density (overall) and configuration
- Stability (tendency of the materials to remain at the deployed location)
- Durability (tendency of the materials to remain intact over time)
- Habitat value (amount of suitable habitat for marine species)

ECDMR will use recognized artificial reef "best management practices", scientific literature, artificial reef agency/organization publications, experience from previous artificial reef experience, and any other credible sources of information when making public artificial reef materials and construction determinations. It is recognized however, that materials may become available for use as artificial reefs for which there is no previous artificial reef experience. In such cases, ECDMR shall use particular care to ensure that the materials, if deployed, create no harm to the marine environment nor endanger marine or human health. Such care shall include: consultation with other artificial reef professionals and regulatory personnel; deployment at greater depths and/or at maximum distances from permit boundaries; modification of the materials configuration. Under certain circumstances, "pilot projects" may be conducted with a limited number of reef materials to be monitored to answer uncertainties.

Artificial reef materials will be carefully selected, with particular attention placed on material durability. Concrete materials have proven to be stable and durable, providing "long-term" habitat for reef-associated fauna. Several prefabricated concrete and concrete/steel artificial reef modules are locally available and have been historically utilized for Escambia County artificial reefs. Monitoring results (see Section IV below) will yield continuously better information for planning public artificial reef construction. Concrete bridge rubble also has proven to be effective habitat.

Steel vessels and other structures have proven to provide long-term, stable and durable artificial reef habitat. Reef height and attractiveness to divers are two advantageous reef characteristics that are often achieved with steel objects. However, care must be taken to assure stability and durability of metals that will rust and corrode over time. Careful cost-benefit comparisons should be performed to make wise artificial reef selection decisions.

Public artificial reef materials should be placed on the seafloor in a planned manner. Decisions regarding reef size, reef material quantity, and reef spacing should take into account the goals for each particular artificial reef deployment. User needs should be balanced with habitat requirements of marine life expected to be attracted to the artificial reef. Results of surveys, monitoring, and scientific studies should be considered in artificial reef planning. Construction of large artificial reefs capable of simultaneously supporting a number of fishing and/or diving vessels should be balanced with the construction of "patch" reefs that may allow users to "spread out".

ECDMR and authorized representatives shall be responsible for procuring funds for the implementation of this Program. Potential sources of funding for artificial reef construction include:

- Grants
- Vessel registration fees (County portion) *Note: Florida Legislature (via HB7175) prohibited county use of these funds for artificial reef construction in July 2006*
- Civic organizations
- Benefactors
- Private industry, especially Fishing/Diving related businesses
- County General Fund

IV. Artificial Reef Monitoring

Artificial reef monitoring is considered an important component of artificial reef management (National Artificial Reef Plan., Stone, 1985). Indeed, true "management" of a public artificial reef program must include post-construction monitoring. However, monitoring has been interpreted in different ways by different individuals, managers, and agencies. For the purposes of this Plan, artificial reef monitoring will consist of four "Levels". The specific Monitoring Level(s) utilized will be determined by the relevant factors, including: available resources (funding and personnel); relative need for particular or specific information; relative quantity (or potential) of material in question.

It is desirable to perform artificial reef monitoring to the fullest possible extent. However, fiscal and/or operational constraints may restrict monitoring to the level(s) deemed necessary or important. To the greatest extent possible, Escambia County will monitor and assess the effectiveness of public artificial reefs.

Level 1: Geographic Monitoring

Exact coordinates (latitude/longitude and LORAN) of each public artificial reef and permit area boundary will be determined using separate Differential Geographic Positioning System (DGPS) and LORAN receivers. Latitude/longitude coordinates should be recorded in degrees and decimal minutes (e.g., 30^{O} 12.345'N; 87^{O} 12.345'W). To determine with certainty the position of public artificial reefs, after the materials have been located using fathometer, visual certification (via SCUBA or other visual remote equipment) will be accomplished. Plotting of public artificial reefs will be performed utilizing latitude/longitude coordinates from DGPS equipment.

These data are important to certify to permitting agencies that materials are at the designated location(s) and to verify permit compliance. The quality of these data are of the utmost importance to artificial reef users. The information is also important for comparison after storms or other events to determine if the artificial reef has been moved.

Level 2: Artificial Reef Physical Attribute Monitoring

Physical characteristics (e.g., length, width, height, materials type(s), and configuration) of public artificial reefs are measured and recorded using waterproof writing materials and/or underwater photography/videography. Other important data include: habitat

complexity, condition and orientation of materials, and percent of materials that have subsided below the seafloor.
These data are important to determine the stability and durability of the artificial reef materials under consideration. Underwater configuration may also provide information regarding effectiveness of deployment methods. Amount of reef that has subsided into the seafloor may yield information regarding sediment suitability and hydrodynamic forces at that location.

Level 3: Reef utilization and user satisfaction
Reef utilization and user satisfaction information may be obtained in several ways, each with its advantages and disadvantages. On-site surveys are conducted on the water while the public artificial reef user is located at an artificial reef. Advantages of this approach include: ease of determination of the number of vessels at a particular (and nearby) artificial reef; fish catch information at the specific reef may be obtained; answers to survey questions are more likely to reflect user's satisfaction while at the reef; and ability to sample users at a predetermined number/variety of artificial reefs. Disadvantages include high cost of survey due to the need for surveyor to use a boat, vessel-to-vessel communication difficulty, and reef user may become irritated at the interruption of fishing/diving activities.

An alternate approach, ramp-intercept survey, is less expensive and easier to communicate, however, the accuracy of the responses may be lower than that of on-water surveys. Catch information may not allow determination of specific catch at specific reef(s); this information, combined with Level 4 data, may help explain some of the variation in Level 4 data.

Other sampling methods for artificial reef user data include "customer satisfaction" surveys conducted by Escambia County Marine Resources Division. These surveys may be conducted by various methods including: direct mail, telephone, and internet.

Reef utilization and user satisfaction information are important to artificial reef managers for short and long term planning. Reef preferences and overcrowding may guide decisions for reef materials and/or placement. Level 3 data are important for the evaluation of Program Goals (#'s: 3,5, and6). On-water surveys have a "public relations" benefit, and artificial reef managers may make more confident decisions with knowledge gained in the field.

Level 4: Biological Monitoring
Biological monitoring protocols vary widely among artificial reef managers and researchers, probably because of differences in water conditions, habitat/community types, and questions/hypotheses. A survey of the scientific literature is an important step in determination of methodology for a particular biological monitoring study. Thus, it is outside the scope of this Plan to attempt to prescribe protocols.

Whenever possible, biological information should be recorded. ECDMR usually records the presence of commercially/recreationally important fishes observed during Level 2 monitoring dives. Although SCUBA divers most often obtain Level 4 data using underwater video or pencil and waterproof paper, remote sensing technology may soon provide reliable methods that are not limited by divers' "bottom time".

Although arguably the most difficult and expensive to obtain, Level 4 data have the potential to be the most valuable in artificial reef Program management. As previously mentioned, Level 3 (catch) data may explain some of the variation in Level 4 data.

***Oriskany Reef* Monitoring:**
To accomplish the Navy's plan to reef the decommissioned aircraft carrier *Oriskany*, approval was required from the US Environmental Protection Agency (EPA) to sink the ship with approximately 750 lbs of non-liquid polychlorinated biphenyls (PCBs) remaining onboard. The Navy's computer models indicated the remaining PCBs would not exceed the criteria of the federal Toxic Substance Control Act for environmental of human health risk. EPA's approval was granted with the condition of requiring Escambia County and Florida Fish and Wildlife Conservation Commission (FWC) to monitor fish tissue concentrations of PBCs from recreationally sought fish collected from Oriskany Reef.

V. References and Resources

Although it is outside the scope of this Plan to list all pertinent artificial reef works, those references and resources that are considered "standards" will be used to guide Escambia County's Artificial Reef Program.

Guidelines for Marine Artificial Reef Materials. 1997. Gulf States Marine Fisheries Commission. 117pp.

International Council for the Exploration of the Sea, Journal of Marine Science, 2002. Seventh International Conference on Artificial Reefs and Related Aquatic Habitats.

Coastal Artificial Reef Planning Guide. 1998. Joint Artificial Reef Technical Committee of the Atlantic and Gulf States Marine Fisheries Commissions. 45pp.

NOAA Charts (Nos. 11360, 11382, 11383, 11384, 11378)

Florida Artificial Reef Strategic Plan

National Artificial Reef Plan

Final Report: Escambia County Artificial Reef Monitoring Project- Site 7 (Turpin, 2001)

An Evaluation of Artificial Reefs after the Influences of Hurricanes and Fishing (Bortone and Turpin, 1997)

Bulletin of Marine Science Vol. 44, No. 2 (March 1989): Fourth International Conference on Artificial Habitats for Fisheries, Nov. 2-6, 1987, Miami, Florida.

Bulletin of Marine Science Vol. 55, Nos. 2-3 (September 1994): Fifth International Conference on Aquatic Habitat Enhancement, Nov. 3-7, 1991, Long Beach, California.

Seaman, W. Jr. 2000. Artificial Reef Evaluation with Application to Natural Marine Habitats. CRC Press, Boca Raton, Florida. 246pp.

Seventh International Conference on Artificial Reefs and Related Aquatic Habitats. 2002. ICES Marine Science Symposia, Vol. 217.