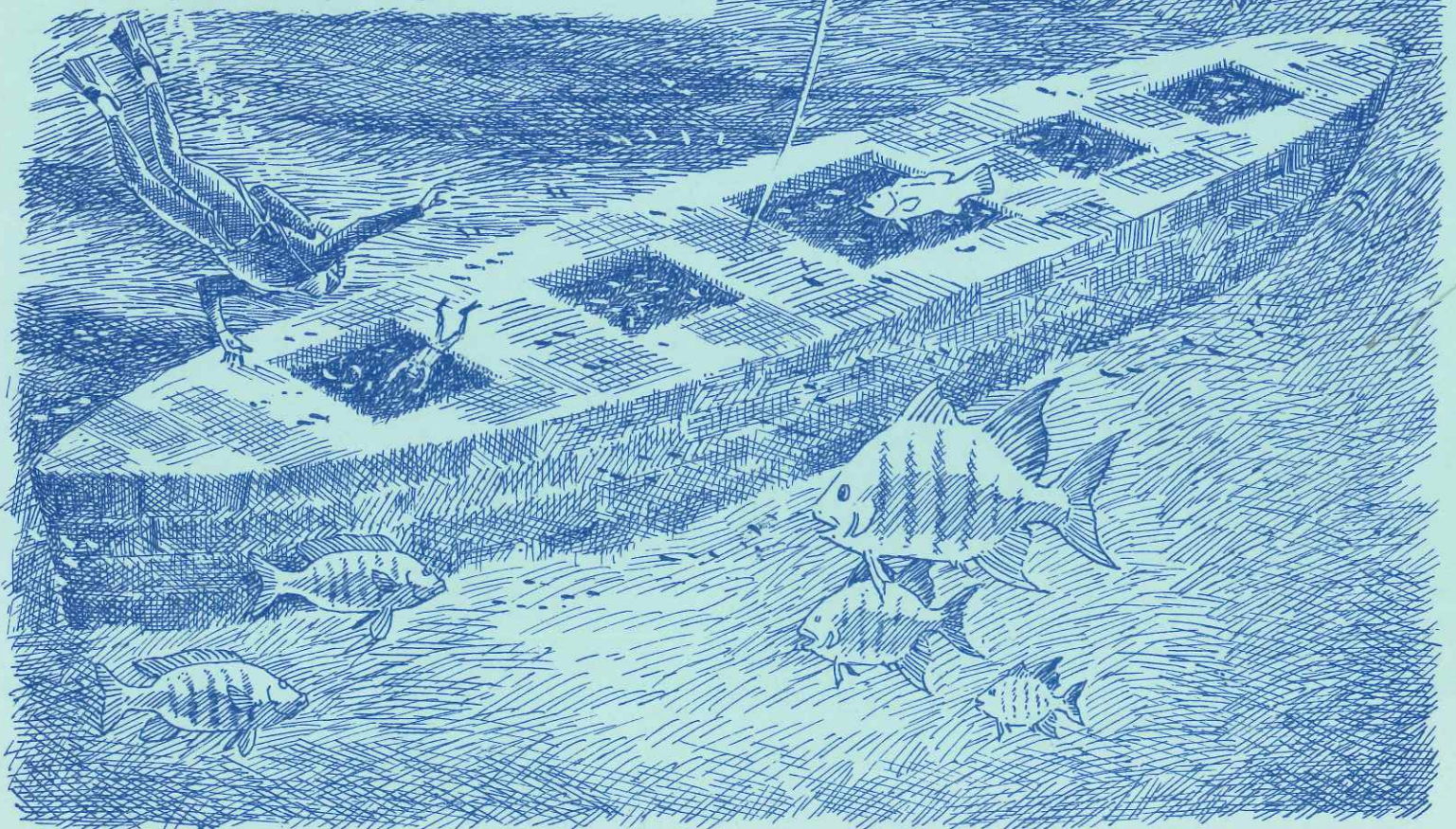


ARTIFICIAL REEFS

THE SINKING OF SURPLUS W.W. II LIBERTY SHIPS OFF THE TEXAS COAST FOR RECREATIONAL PURPOSES COULD GREATLY ENHANCE EXISTING FISHING OPPORTUNITIES.

The federal government has recently made surplus World War II Liberty Ships available to the states for use as offshore artificial reefs. If properly cleaned and partially stripped to eliminate undesirable materials and safety hazards, the 440-foot ships could be a unique and beneficial resource for Texas' saltwater fishermen and divers. The ships must be located for easy access while not threatening navigation. Proper marking with lighted buoys must be provided to enable fishermen to locate the reefs and allow shrimp trawlers to avoid them. Artificial reef ventures in Texas and elsewhere have demonstrated that they can improve fishing opportunities without interfering with other uses of the sea or causing environmental damage. Efforts to convert several World War II Liberty Ships into artificial reefs are currently underway along the Texas coast.



WHAT ARE ARTIFICAL REEFS AND WHAT DO THEY ACCOMPLISH?

Artificial reefs are man-made structures placed on the sea bottom of coastal waters. They can be built from any types of materials, ranging from old car bodies, tires and building rubble to specially constructed concrete blocks.

Most reefs are constructed from materials which man has discarded. More than 150 artificial reefs have been constructed in U.S. coastal waters since the first automobile body reef was built off the coast of Alabama in 1953. More than a dozen have been built at various locations along the Texas coast in both the bays and offshore since 1955. Though there have been some individual problems, most reef building efforts have generated substantial followings among saltwater anglers and divers.

The scientific basis for why artificial reefs improve fishing is easily understandable. The reefs provide a hard, exposed substrate of increased surface area for barnacles and other sedentary marine forms to attach themselves. Additionally, the many crannies provide hiding places for small fishes which, in turn, attract larger fishes sought by anglers.

Obviously then, an area surrounding a large sunken vessel or other bottom obstruction is more conducive to fishing than the flat gulf bottom.

Two schools of scientific opinion exist concerning the value of artificial reefs. Some scientists maintain that such reefs significantly increase the biological productivity of a large area. Others contend that such reefs only serve to concentrate existing populations into a small area which is readily accessible to fishermen.

Whichever is correct, the fact remains that artificial reef programs, if properly conducted, can greatly enhance fishing and provide desirable sites for divers.

WHAT MUST BE DONE TO GET LIBERTY REEFS FOR TEXAS

World War II Liberty Ships are provided by the federal government on a "where is, as is" basis. There are 18 Liberty Ships in the reserve "mothball" fleet at Beaumont. This is approximately one-half of the total number of available ships in the U. S., the others being located in Virginia, Alabama and California. While there are more than 650 World War II merchant vessels in the reserve fleets, most are Victory Ships rather than Liberty Ships, and the former are not available for use as reefs under PL92-402. There are also many smaller mothballed naval vessels and some have advocated using these as reef materials.

The Secretary of Commerce will provide the ships to the states upon approval of application made by the Governor or his designee. Included in this application must be an environmental impact statement showing proposed locations and details for cleaning and partial salvaging. Approval by the U. S. Corps of Engineers and the Coast Guard is also required to insure navigation safety.

Much work remains even after the ships are acquired by the state. The ships must be towed to a salvage yard where all fuel oil, which has been in the tanks for over 25 years, must be cleaned out; floatable materials such as wood must be removed; and all hatches and doors taken off in order to eliminate hazards to divers.

Large holes should be cut into all compartments and holds to insure that adequate light will enter to promote biological activity, provide ample circulation and eliminate "dead spots."

After all of this is accomplished, the ships must be towed to the reef sites and properly scuttled, a process requiring careful planning and involving significant expense.

Fortunately, these ships have a high salvage value which can help balance the costs of building Liberty Reefs. Salvageable materials include copper, brass and scrap iron. Recently, some scrap dealers have purchased such ships for over \$50,000.

The Texas Council on Marine-Related Affairs recognizes the desirability of a comprehensive artificial reef program. An overall program should encompass bay reefs and shallow gulf reefs in less than 50-foot depths and include the consideration of other materials such as old tires, barges and building rubble.

However, care must be taken to insure that the creation of reefs for recreational purposes does not interfere with other uses of the sea.

Many active reef programs involving a variety of materials and approaches are being conducted in the United States today. The National Oceanic and Atmospheric Administration, working through the National Marine Fisheries Services, provides consultation to states desiring to undertake artificial reef programs.

In addition to their recreational potentials, Liberty Reefs offer an opportunity for scientific research. By conducting studies prior to, during and after installation of the reefs, it will be possible to monitor the changes during alteration of the shelf.



SITE LOCATION

Many factors must be considered in determining the best locations for Liberty reefs.

Obviously, it is necessary to locate them a safe distance from established shipping fairways and anchorages. Also, the U. S. Corps of Engineers requires that there be a minimum of 50 feet clearance between the top of a reef and the water surface. Since these ships, when partially cut down, would be about 30 feet high, they must be sunk in at least 80 feet of water.

Accessibility to the reef by small boat owners is vital. About 30 miles beyond the jettied passes is considered a reasonably safe distance for such boats to venture. Therefore, reefs should be within this distance.

Approximately 100-110 feet is considered the maximum safe depth for amateur divers to go. Thus, reefs should be located in water depths of not more than 110 feet.

Although no specific studies have been conducted along the Texas coast, assorted data and related experiences indicate that water depths of about 100 feet should be desirable to enhance the marine ecosystem. Much of the gulf near shore has a soft bottom in which reefs would sink into the sediment, so it is mandatory that the reefs be located on firm bottoms.

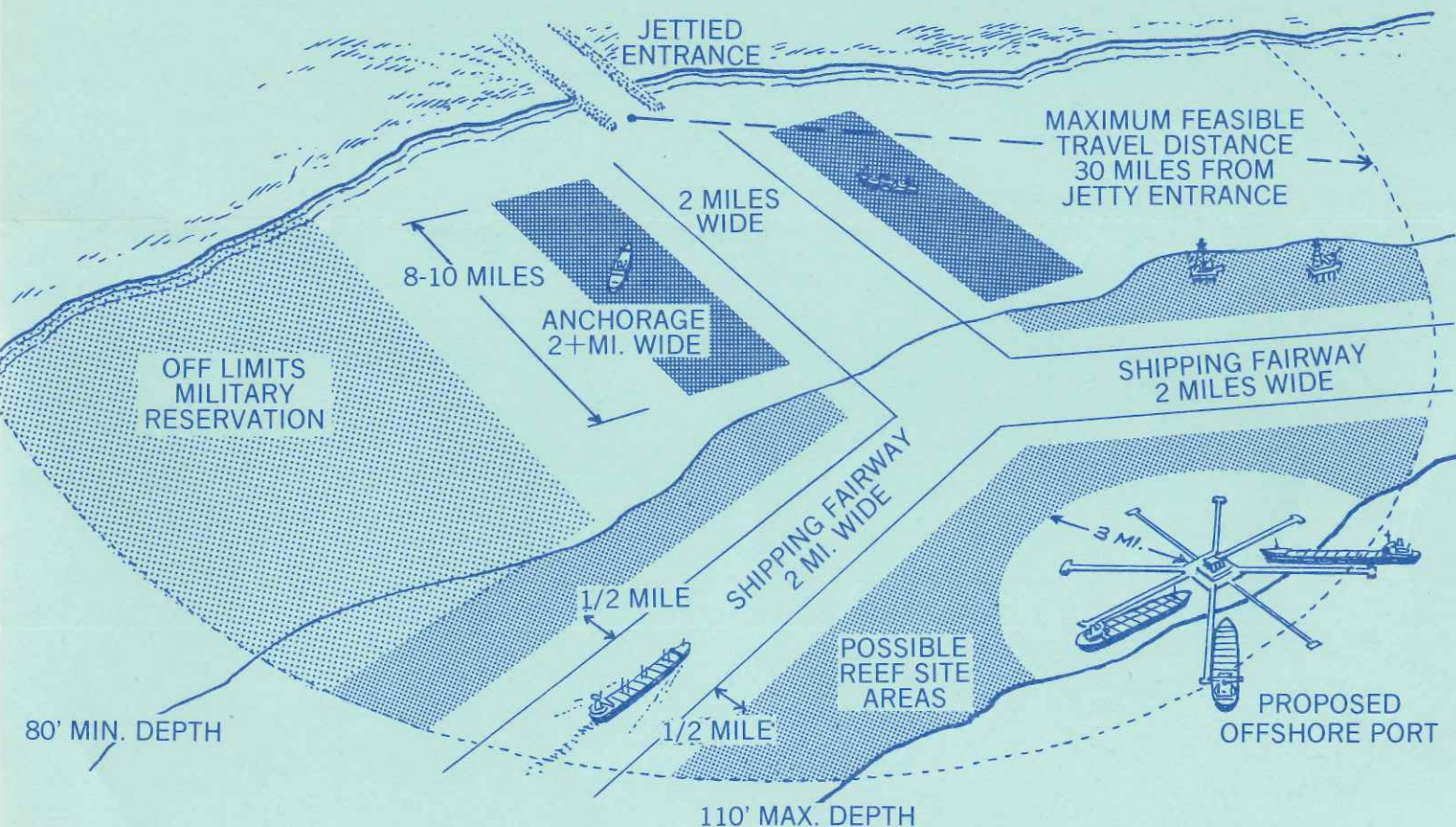
Numerous obstructions, both natural and man-induced, exist on the gulf bottom and pose constant threats to shrimpers' trawls. Artificial reefs, suitably marked, located near these obstructions could clearly indicate the location of present unmarked obstructions.

Ultimate decisions on specific reef locations

cannot be made until more details of the project are determined, including the number of ships available, amount and sources of funding, timing, the degree to which the ship will be cut down, and what agency will be responsible for the reefs. However, enough is already known to make it clear that a series of deep-water Liberty Reefs could be built along the Texas coast accessible from different areas.

Regardless of the locations of Liberty Reefs, it will be mandatory that they be well marked with a lighted buoy, radar reflector and whistle or bell. Provisions must be made to properly maintain the buoys. This must include relocation and re-marking if the original buoys are lost in a hurricane. Costs for maintaining such buoys vary depending on the specific case, but estimates generally run \$3,000-\$7,000 per buoy annually.

The accompanying illustration shows a hypothetical reef location example using the criteria previously discussed. The first step, once a general region has been selected, is to eliminate the areas in which a reef can not be located, such as those discussed above. By the time these areas have been eliminated due to possible conflicting uses or safety precautions, the number of possible reef sites have been substantially reduced. To select a specific site it becomes necessary to locate firm bottom conditions, identify known obstructions and determine several candidate sites. After selection of candidates, it will be necessary to do some on-site investigations including bottom coring, biological sampling, and current measurements before a final decision can be made. Hearings will also be necessary to get public input on the matter.



TEXAS COUNCIL ON MARINE-RELATED AFFAIRS

The Texas Council on Marine-Related Affairs was created by the 62nd Texas Legislature and is statutorily charged to assist the state in the comprehensive assessment and planning of coastal and marine-related affairs in this state and their relationship to national and international marine-related affairs.

In order to accomplish this, the council is directed to establish and maintain liaison relationships with the federal government; identify and articulate major problems, issues, opportunities and goals relative to coastal and marine affairs; and provide an information service to public and private sectors.

The Marine Council is not an "operating agency" in the sense of most state agencies. Rather, it is an investigatory body charged with providing advice, assistance and recommendations to the Legislature on coastal and marine matters. This is accomplished directly through the two legislative members, who serve as the chairman and vice chairman of the Council, and by information dissemination.

The Council's purpose is not to become involved in the operations of programs, because this is the responsibility of existing state agencies. Rather, the Council serves in a "brokerage" capacity by bringing together groups with corresponding interests and acting as a catalyst by focusing legislative interests on

issues and suggesting remedies which may be implemented by existing line agencies.

The Marine Council is a 12-member body with representation from government, business, higher education and the public at large. The Governor, Lieutenant Governor and Speaker of the House make appointments to each category. By law, the Council has one state senator and one state representative in its membership.

Because of its broad legislative charge, the Marine Council becomes involved in a number of diverse issues. When initially established, the Council was active in the "superport" issue. In fact, its initial chairman and vice chairman cosponsored the legislation establishing the Texas Offshore Terminal Commission. Currently, interest and energies are being focused on the "Liberty Ship Reefs", coastal zone management, commercial fishing, recreation, problems in providing coastal residential housing, subsidence and related groundwater management, the impact of international money situation on Texas-based marine activities, the energy crisis and marine transportation.

As time goes on and issues change, the Texas Council on Marine-Related Affairs will continually revise and reorient its activities to meet the challenges of the future.

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JOHN J. PEPE
Houston

CECIL REID
Austin

JOE C. MOSELEY
EXECUTIVE DIRECTOR
Austin

For Further Information

Contact:

JOE C. MOSELEY
Executive Director
(512) 476-3561

TEXAS COUNCIL ON MARINE-RELATED AFFAIRS

Box 2910, Austin, Texas 78767