

**STUDY TITLE:** Study to Conduct National Register of Historic Places: Evaluations of Submerged Sites on the Gulf of Mexico Outer Continental Shelf

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**CONTRACT NUMBER:** 1435-01-04-RC-73218

**SPONSORING OCS REGION:** Gulf of Mexico

**APPLICABLE PLANNING AREAS:** Central and Western Gulf of Mexico

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**KEY WORDS:** Gulf of Mexico; marine archaeology; remote-sensing; National Register of Historic Places; shipwreck; MMS avoidance criteria; World War II; Spanish-American War; Civil War

**BACKGROUND:** The MMS has regulatory responsibility for mineral exploration and development on the Gulf of Mexico Outer Continental Shelf (OCS). Part of that responsibility includes considering the effects of MMS-permitted undertakings on archaeological sites. Current Notices to Lessees require oil and gas operators to conduct geophysical survey of areas proposed for development and submit the data to qualified archaeologists for analysis. The archaeologist makes recommendations for every potentially significant magnetic and/or acoustic anomaly identified during survey. Industry operators typically avoid potential archaeological sites identified by the examining archaeologist. As a result, the MMS has amassed little information regarding the identification of these anomalies, which could potentially be of value in both eliminating extraneous, archaeologically insignificant sites from further concern and in refining the analytical methods used in selecting certain sites for avoidance in the future. While avoidance serves the purpose of protecting some cultural resources, historic and circumstantial evidence suggests that a substantial proportion of historic shipwrecks are missed by industry surveys. This study was conceived in order to address these issues.

**OBJECTIVES:** (1) Evaluate the National Register of Historic Places eligibility of select submerged sites on the Gulf of Mexico OCS; (2) Assess the adequacy of current MMS avoidance criteria; (3) Assess industry compliance with government protective measures; (4) Apply lessons learned from study to eliminate archaeologically insignificant sites from further concern; and (5) Provide feedback useful for evaluating the effectiveness of the MMS historic preservation program.

**DESCRIPTION:** Archaeological diver investigations and remote-sensing surveys were conducted at 14 known sidescan sonar targets. The targets were investigated over two separate field seasons in May 2004 and May 2005. Nine targets were visited in 2004 and five in 2005. Remote-sensing data collected included close-order magnetic, high resolution sidescan sonar, and ROV video. Sub-meter accurate differentially corrected GPS positioning was recorded in conjunction with magnetic data and also embedded in sonar imagery. Survey line spacing was no greater than 30 feet (9.1 meters) and GPS and magnetic data were recorded at 1-second intervals. The sidescan sonar imaged 50 meters (164 feet) to either side of its path and recorded constantly. Processing of remote-sensing data entailed the creation of magnetic contour maps and mosaic imagery for each site. The remote-sensing data enabled nautical archaeologists to accomplish objectives 2-5 above. Archaeological diver and ROV investigations were conducted at each site primarily to accomplish objective 1 above, but also to provide additional data to accomplish objective 3.

**SIGNIFICANT CONCLUSIONS:** Three shipwreck sites, *M/S Sheherazade*; *SS R.M. Parker, Jr.*; and *SS Castine*, were recommended as eligible for listing on the National Register of Historic Places and the appropriate nomination forms were completed.

At three shipwreck sites investigated, industry construction had occurred in the immediate vicinity. This construction was conducted under MMS avoidance measures tailored to each shipwreck site. While construction adhered to avoidance zones, PBS&J noted areas for improvement. Under current MMS survey requirements, avoidance of magnetic anomalies could better be accomplished through a variable-sized avoidance zone tailored to each anomaly perimeter rather than a set distance from a central point. Likewise with sidescan sonar targets, protection would better be afforded through an avoidance zone tailored to the margins of a target. This would account for such factors as vessel size and variable GPS accuracy. Position estimates from surveys conducted in deeper water can vary significantly due to necessarily longer sensor layback. Increasing avoidance zones proportional to the increase in sensor layback during surveys conducted in relatively deeper water could counteract this problem. Avoidance zones additionally would offer an added measure of protection against collision were industry work vessels required to honor avoidance zones as strictly as construction impacts, especially at shallower sites. Aside from the direct impact resulting from the construction of industry facilities, an indirect impact exists during the construction phase – lay barge anchoring. PBS&J noticed a lay barge anchor spread implemented during the construction of a pipeline immediately adjacent to an MMS avoidance zone crisscrossed the zone numerous times. As water depths decrease and/or anchor

cables lengthen the potential to impact exposed or shallowly buried shipwrecks increases. Requiring lay barge anchor spreads to honor avoidance zones as strictly as the anchors themselves could prevent unintentional damage to sites.

On the Gulf of Mexico OCS many shipwreck sites are afforded a high level of protection due to their discovery, while buried wooden hulls located in relatively shallow water may be eluding detection during industry surveys. These wrecks represent potentially the largest class of shipwrecks on the OCS and are marked by relatively small magnetic anomalies and by ambiguous to nonexistent sonar targets. To fill this archaeological gap would require a reduction of remote-sensing survey line spacing, revised methodology for processing and analyzing data, and new selection criteria. A combination of the three would better allow the nautical archaeologist to both identify potential shipwrecks and eliminate archaeologically insignificant debris items.

**STUDY RESULTS:** Close-order magnetic data, high resolution sidescan sonar imagery, ROV video footage, and diver investigative data were collected at fourteen known sidescan sonar targets over two field sessions. Diver and ROV site investigations and historical research allowed identification of most of these targets and an assessment of National Register of Historic Places eligibility status. One site, the USS *Hatteras* (41GV68), had previously been identified and was visited as part of an ongoing monitoring effort. Of the remaining targets nine were identified as shipwrecks and four were not relocated. Four of the shipwrecks, *M/S Sheherazade*; *R.M. Parker, Jr.*; *SS Castine*; and *Caribe No. 500*, are historic vessels. Research conducted at various libraries and archives resulted in the creation of detailed historical narratives for these vessels, with the exception of the *Caribe No. 500*. Three shipwrecks are modern and the remaining two remain unidentified.

Remote-sensing data processing entailed the creation of magnetic contour maps and mosaic imagery of each located site. This data allowed PBS&J to assess compliance with government protective measures at three shipwreck sites. Along with previous PBS&J remote-sensing work, data from this study provided the means to draw significant conclusions concerning the current level of protection afforded shipwrecks on the Gulf of Mexico OCS. Moreover, PBS&J was able to devise alternate survey, processing, and analysis options designed to improve discovery and protection of shipwrecks on the Gulf of Mexico OCS.

**STUDY PRODUCT(S):** Enright, J.M., R. Gearhart, D. Jones, J.J. Enright. 2006. Study to conduct national register of historic places evaluations of submerged sites on the Gulf of Mexico OCS. A final report by PBS&J for the U.S. Dept. of the Interior, Minerals Management Service Gulf of Mexico OCS Region, New Orleans, LA. Contract No. 1435-01-04-RC-73218. MMS OCS Study 2006-036. 147 pp. + 1 not for public disclosure appendix.

Enright, J.M. *Sheherazade* National Register of Historic Places registration form. A nomination by PBS&J for the U.S. Department of the Interior, Minerals Management Service Gulf of Mexico OCS Region, New Orleans, LA.

Enright, J.M. *R.M. Parker, Jr.* National Register of Historic Places registration form. A nomination by PBS&J for the U.S. Department of the Interior, Minerals Management Service Gulf of Mexico OCS Region, New Orleans, LA.

Jones, D. *Castine* National Register of Historic Places registration form. A nomination by PBS&J for the U.S. Department of the Interior, Minerals Management Service Gulf of Mexico OCS Region, New Orleans, LA.