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STUDY TITLE: An Annotated Bibliography on Marine and Coastal Fishes Subject to Impingement and Entrainment by Cooling Water Intake Systems in the Northern Gulf of Mexico

REPORT TITLE: Marine and Coastal Fishes Subject to Impingement by Cooling-Water Intake Systems in the Northern Gulf of Mexico: An Annotated Bibliography

CONTRACT NUMBER: MMS 14-35-99-CA-30951-85249

SPONSORING OCS REGION: Gulf of Mexico

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BACKGROUND: Since the early 1970's cooling-water intakes have been identified as having a potential adverse impact on aquatic organisms due to impingement/entrapment and entrainment. The Environmental Protection Agency (EPA) is proposing a series of new rules to address the impingement and entrainment of fishes and shellfish by cooling-water intake systems on all surface waters of the United States, including the open ocean. In response to this information need, MMS gathered information about the species of fish in the Gulf of Mexico and about research conducted on the impingement and entrainment of fishes and other organisms in coastal and marine ecosystems.

OBJECTIVES: To meet the information needs of MMS and EPA, this study provides an annotated bibliography that includes all research conducted in marine and coastal waters concerning the impingement and entrainment of estuarine and marine organisms by cooling water intake systems. The literature search includes a brief summary of references that address the distribution and

life histories of fish in the Gulf of Mexico, since this is the resource that may be impacted by cooling water intake systems.

DESCRIPTION: A total of 31,610 documents were obtained through 432 individual searches and each database output was reviewed on-line to determine if it contained relevant references. Almost 200 files containing references with or without abstracts were scrutinized and an alphabetical list of all potentially useful references was prepared. After the bibliography was completed, references were reviewed again, edited for uniformity, and sorted into four major categories as follows: 1) studies of fish impingement/entrainment by cooling-water intakes in marine and estuarine environments, 2) studies related to assessment of fish impingement/entrainment by cooling-water intakes, 3) studies related to mitigation measures of fish impingement/entrainment by cooling-water intakes, and 4) other relevant studies related to fish impingement/entrainment by cooling-water intakes. Finally, a list of all fish species subject to impingement or entrainment, mentioned in the abstracts was prepared and additional information, such as maximum length attained and ocean of occurrence was obtained from literature.

SIGNIFICANT CONCLUSIONS: Most of the results obtained through this search were references about studies on fish impingement or entrainment by cooling-water intakes of nuclear or thermoelectric power plants located on estuarine or marine environments. Only one reference specific to fish impingement or entrainment by cooling-water intakes of oil platforms, Littrell and Biaggi (1979), was actually found, which means that such information is generally unavailable through the searched data bases. However, it is possible that some information exists in unpublished corporate documents.

STUDY RESULTS: A total of 342 references are presented in this report in four different categories: 138 are references on biological studies directly related to fish impingement or entrainment by cooling-water intake systems in marine and estuarine environments; 74 are references on mathematical models to assess fish impingement or entrainment by cooling-water intake systems, 59 are references related to mitigation measures for fish impingement or entrainment, and 71 are other relevant references on fish impingement or entrainment by cooling-water intake systems or closely related topics. A total of 95 fish species were found in the abstracts, including 53 species found in U.S. waters and 10 species confirmed in the northern Gulf of Mexico.

STUDY PRODUCTS(S): Martinez-Andrade, F. and D. M. Baltz. 2003. Marine and Coastal Fishes Subject to Impingement by Cooling-Water Intake Systems in the Northern Gulf of Mexico: An Annotated Bibliography. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study MMS 2003-040. 117 pp.