OCS Study
MMS 2005-063

UPDATE OF SELECT ENVIRONMENTAL INFORMATION FOR NORTON BASIN, CHUKCHI SEA/HOPE BASIN AND COOK INLET PLANNING AREAS FOR THE ALASKA OUTER CONTINENTAL SHELF (OCS) REGION.

FINAL REPORT

Submitted by

LGL Alaska Research Associates, Inc.
1101 East 76th Avenue, Suite B
Anchorage, Alaska 99518

Prepared For

MMS U.S. Department of the Interior
Minerals Management Service
Alaska OCS Region

28 February 2006

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This study was funded by the U.S. Department of the Interior, Minerals Management Service (MMS), Alaska Outer Continental Shelf Region, Anchorage, Alaska, under contract No. 0103CT71930, as part of the MMS Alaska Environmental Studies Program.

28 February 2006

Project Organization

Fish	Marine Birds	Marine Mammals	Ecosystems	Social systems	Quality Assurance/ Quality Control	Report Preparation
B. Haley	A. Haskell	A. Haskell	B. Haley	M. Galginaitis	C. Sorrie	J. Huddleston
A. Haskell	S. Haskell	S. Haskell	A. Haskell		S. McKendrick	V. Priebe
S. Haskell	R. Rodrigues	S. McLean	S. Haskell		V. Priebe	
M. Nemeth		R. Rodrigues	R. Rodrigues			
R. Rodrigues		M. Williams				

EXECUTIVE SUMMARY

The National Environmental Policy Act (NEPA) of 1969 (42 USC 4321-4347) requires that all federal agencies use a systematic, interdisciplinary approach to ensure the integrated use of the natural and social sciences in all planning and decision making that may have an effect on the human environment. In support of these efforts, an extensive search of available literature including material published in the open literature, gray literature reports, and material published on World Wide Web sites was conducted for the Norton Sound, Chukchi Sea/Hope Basin, and Cook Inlet planning areas on behalf of the Minerals Management Service. The search emphasized new literature and other available scientific information on fish, marine mammals, marine birds, ecosystems, and human social systems that would be important to the analysis of the impacts of oil and gas exploration and development in the planning areas. References were incorporated into a ProCite® database that can be searched by keywords, authors, and titles of the reports. Each entry in the database contains full citations that will allow users of the database to obtain the report and in most cases provides an abstract or brief synopsis of the article that will allow users to determine if the report or article contains information relevant to their needs. All entries have been reviewed by subject matter experts and have been checked through several QA/QC procedures to reduce errors in the entries.

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Title: Update of Select Environmental Information for Norton Basin, Chukchi Sea/Hope Basin and Cook Inlet Planning Areas for the Alaska Outer Continental Shelf (OCS) Region.

Principal Investigator: Dale W. Funk

INTRODUCTION

The National Environmental Policy Act (NEPA) of 1969 (42 USC 4321-4347) requires that all federal agencies use a systematic, interdisciplinary approach to ensure the integrated use of the natural and social sciences in all planning and decision making that may have an effect on the human environment. In the Final Proposed Outer Continental Shelf Oil and Gas Leasing Program 2002-2007, released in July 2002, the Minerals Management Service (MMS) proposed lease sales in the Norton Basin, Chukchi Sea/Hope Basin, and Cook Inlet planning areas.

A draft Environmental Impact Statement (EIS) was recently released for oil lease sales in the Cook Inlet Planning Area (OCS EIS/EA MMS 2002-065, Draft Environmental Impact Statement, December 2002), but it has been a number of years since the MMS released a detailed lease sale EIS document that described potential development scenarios in the other planning areas, although an EIS for the OCS oil and gas leasing program, 2002-2007, described general development scenarios for these areas. In the Chukchi Sea/Hope Basin planning areas the most recent EIS for the Outer Continental Shelf (OCS) issued was OCS EIS/EA MMS 90-0095, Chukchi Sea Lease Sale 126 Final Environmental Impact Statement, January 1991. In the Norton Sound Planning Area the most recent EIS for the OCS issued was OCS EIS/EA MMS 90-0009, Norton Sound OCS Mining Program Final Environmental Impact Statement, March 1991.

The writing of a comprehensive EIS, that uses the best available science to analyze potential impacts and provide industry and wildlife managers with appropriate information to determine how and if development in an area should proceed, requires extensive review of the literature on the natural resources of the area in question. An annotated bibliography that updates select environmental information for the Norton Sound, Chukchi Sea/Hope Basin, and Cook Inlet planning areas has been accumulated to address the needs of the MMS in preparing future planning documents including EIS's and Environmental Assessments (EA's) for these lease sale areas. The bibliography was established in a ProCite® database, a common bibliographic software package. ProCite® allows flexibility in the searching and use of the bibliographic information as well as the production of citation lists during document preparation. Bibliographies for each of the lease sale areas are contained in separate files on the accompanying CD.

APPROACH

For the Norton Sound Planning Area we identified new published literature and other available information on protected species. For the Chukchi Sea/Hope Basin Planning Area we identified similar sources for information on fish, marine mammals, marine birds, ecosystems, and human social systems of the region. We focused our literature searches to identify new information that may be important in evaluating the impacts of oil and gas exploration and development in the planning areas. The review covers all new information since the most recent EISs for these areas from 1991-2003. The search is complete through 2003 and includes information from January through December 2004, although a lag time in the appearance of some journals makes the 2004 entries more sporadic and the database may not contain all of the articles that will ultimately appear with publication dates in this range. Similarly, some gray literature reports published during 2004 may not have been accessible via our searches and the

database should not be considered complete for the 2004 time frame. A series of final searches was made during late December 2004 and early January 2005 to make the bibliography as complete as possible for 2004. The literature on human social systems was assembled by Applied Sociocultural Research (ASR) of Anchorage.

For the Cook Inlet Planning Area we identified new published literature and other available information on fisheries that might be affected by oil and gas development in the Cook Inlet OCS. The review covers new information from 1998 through September 2004.

The bibliographies are restricted to the boundaries of the planning areas and nearby locations. For instance the Chukchi Sea database includes references for the Bering Strait but generally does not include references for studies conducted in the Beaufort Sea. In some cases references were included if our subject area specialists felt they were important to an assessment of impacts to the organisms using a particular planning area. However, the database should not be considered a complete compilation of material for migratory species that only use a particular planning area during part of the year.

The literature surveys were conducted using an established bibliographic search service provided by the ISI Web of Knowledge for our basic search of the primary literature. This service provides access to search engines that scan the published scientific literature through the Web of Science. The service allows specification of search characteristics that can achieve a thorough compilation of titles and abstracts of journal papers and conference proceedings published in a wide array of scientific disciplines. The service allows connection to and search of various databases including Current Contents connect, Biosis previews, Science Citations Index Expanded, and Social Sciences Citation Index. A list of publication titles was established and reviewed for appropriateness for inclusion in the ProCite® database. We searched the databases using a series of key words that included Norton Sound, Chukchi Sea, Hope Basin, Bering Strait, Cook Inlet, and general search terms including, fish, marine mammals, marine birds, ecosystems, and human cultural systems in association with the geographic search terms. Key words were used singly or in combination depending on the number of citations returned by the search. We also used both scientific and common species names in association with geographic search terms for important species in the area.

Additional literature searches were conducted using search engines at the Alaska Resource Library and Information Services (ARLIS) and the University of Alaska, Anchorage Consortium Library. New titles found during these searches were added to the database. Available abstracts of articles were scanned and incorporated into the ProCite® database. In some cases, subject matter experts reviewed books and articles without abstracts and provided annotations that described pertinent information about the article or book for the bibliographic entry. Again, these searches were limited to the boundaries of the particular planning area and the database does not contain a complete reference set for individual organisms but rather for studies of the organisms that were conducted in and around the planning areas.

A number of state and federal agencies conduct regular surveys of various biological resources in the planning areas, or in associated areas. These monitoring programs produce annual reports of the results of these surveys. For these programs a single entry has been included in the database that indicates the title of the report and the period over which reports have been produced. The annotations to these entries also include information regarding the likelihood of these studies continuing and indicate if additional reports will be available on an annual basis. In some cases these reports may be authored by different people in different years.

For example the marine mammal stock assessments have been authored by different people over a period of many years. This precludes searching these publications by author but they should be retrievable by searching for the title of the publication or by key words.

Internet-based searches for websites of government, non-governmental (NGO) and private organizations that may be sponsoring or conducting research in the planning areas were also conducted. These included entities such as the National Science Foundation, Environmental Protection Agency, the National Park Service, Office of Naval Research, the North Pacific Fisheries Management Council, the International Whaling Commission, Alaska Oceans Network, The PEW Oceans Commission, Coastal America, the Ocean Conservancy, the Nature Conservancy, Sierra Club, World Wildlife Fund, Ducks Unlimited, the Audubon Society, Society of Marine Mammology, The Ecological Society of America, American Geophysical Union, Acoustical Society of America and others. This search was used to establish lists of appropriate contacts to obtain reports and to establish bibliographic entries for material published only on the World Wide Web and not available in printed report form. The amount of information and the number of web pages currently available on the World Wide Web is enormous and it was impossible to provide a complete and comprehensive listing for all of the available web pages. Similarly, within individual sites numerous pages with various types of information may be available. It was not possible to provide descriptions or web addresses for each individual page. Web page descriptions are thus very general and should be used as tools to finding some pertinent information and additional links to sites. However, they should not be considered to be complete accounts of all material available at a web address.

Lastly we contacted appropriate sources at the United States Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Alaska Department of Fish and Game (ADFG), academic institutions and other entities conducting or sponsoring research in the planning areas. These contacts were asked about ongoing studies that would be likely to produce additional research reports in the next year to several years that may be important to analysis of MMS activities in the planning areas.

We learned that ongoing studies are occurring in each planning area. Some information is accessible now through the world-wide-web that will eventually be available in report form. For instance, a long-term mooring study—Bering Strait: Pacific gateway to the Arctic—that began in 1990 maintains a web page that provides information about the project and its findings. That address has been included in the bibliography.

Other current projects being conducted in the Chukchi Sea/Hope Basin region include the Regime Forcing and Ecosystem Response project being conducted by researchers at Dalhousie University and the University of Alaska, Fairbanks. Researchers for this project have collected samples of seabirds and forage species in Chukchi Sea/Hope Basin to assess diets and physiological condition of murres and kittiwakes and the nutritional quality of their prey. This project has been included in the database and published reports and articles will be forthcoming. Similarly a project titled *Trophic pathways on the Chukchi-Beaufort Shelf* that is assessing food web relationships of seabirds and marine mammals in the Bering Strait region and the Chukchi/Beaufort Sea area near Barrow anticipates future publications.

Ongoing studies are also occurring in the Norton Basin area. Some information is accessible now through the world-wide-web that will eventually be available in report form. For instance, the Bering Strait mooring study and the regime forcing study mentioned above for the Chukchi Sea are also relevant for the Norton Sound area and are included in the Norton Sound bibliography. Another series of ongoing studies focuses on salmon in the Norton Sound area. Federal funding has been made available to study the possible causes of a precipitous decline in Norton Sound salmon abundance. Norton Sound Salmon Research and Restoration projects began in 2002 and funding will be available for 5 years. Projects range from escapement enumeration and sampling to an investigation of juvenile salmon in estuarine zones. Annual reports are available on line at http://www.cf.adfg.state.ak.us/region3 /proposals/nsrr/nsrr.php. We have also included this web site as an entry in the ProCite® database.

Inquiries were also made as to the availability of GIS data regarding fish distribution in Cook Inlet that could be used by the MMS while modeling the effects of spills. Contacts included sources described above and investigators involved in recently (since 1997) reported fish distribution studies. Results were limited, considering the relative novelty of GIS and the narrow time period reviewed. Also, the focus on salmon has not been on their distribution throughout the inlet, but on the adults' return – near and inshore. One existing dataset we discovered that was not available through the worldwide web is an extensive database documenting the locations of herring schools and herring spawn in the Kamishak Bay area. It is entered in the webpage format as a computer program.

In addition to the research programs mentioned above, a number of other individuals are conducting studies within the various planning areas. A complete list of individuals contacted and their affiliations are included in Appendix A.

QUALITY ASSURANCE AND QUALITY CONTROL

LGL scientists with appropriate subject matter expertise reviewed all database entries to insure that abstracts and annotations to the entries were appropriate. ASR reviewed the sociocultural citations. Key words were assigned to each entry to allow database searches for specific species, species groups, and subject areas, such as subsistence. Additionally, all entries were checked for spelling and typographical errors that may have occurred during entry of fields in the database. All entries were also checked for completeness and consistency with regard to information and fields used and the database as a whole was checked for duplicate entries.

Appendix A.

Individuals and their affiliations contacted for the Chukchi Sea/Hope Basin planning area.

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NAME	AFFILIATION
Knut Aagaard	University of Washington
Betty Anderson	Alaska Biological Research, Inc.
Gene Augustine	United States Air Force
William Barber	University of Alaska, Anchorage (retired)
Fred DeCicco	Alaska Department of Fish and Game, Sport Fish Division
Sue Detwiler	United States Fish and Wildlife Service
Jesse A. Dizard	Alaska Department of Fish and Game, Subsistence Division
Ken Dunton	University of Texas, Marine Science Institute, Port Aransas, Texas
Paul Flint	Alaska Science Center
Joel Garlich-Miller	United States Fish and Wildlife Service
Robert Gill	United States Geological Survey
Verena Gill	United States Fish and Wildlife Service
Dr. Jackie Grebmeier	University of Tennessee
Dr. Jack Helle	National Marine Fisheries Service, Auke Bay Lab
William Hines	National Oceanic and Atmospheric Administration
Dave Irons	United States Fish and Wildlife Service
Gordon Kruse	University of Alaska, Juneau
Bill Larned	United States Fish and Wildlife Service
Julia Moor Lenz	Alaska Natural Heritage Program
Loh-Lee Low	NOAA, Alaska Fisheries Science Center
David B. Leech	University of Alaska, Institute of Marine Science
Philip Martin	United States Fish and Wildlife Service
Brian McCaffery	United States Fish and Wildlife Service
Jim Menard	Alaska Department of Fish and Game, Commercial Fisheries
Ed Murphy	University of Alaska, Fairbanks
Russ Oates	United States Fish and Wildlife Service
Craig Perham	United States Fish and Wildlife Service
Mary Pete	Alaska Department of Fish and Game, Subsistence Division
Margaret Petersen	United States Geological Survey
Bob Pickart	Woods Hole Oceanographic Institute
Dan Rosenberg	Alaska Department of Fish and Game
Scott Schliebe	United States Fish and Wildlife Service
Marianne See	Alaska Department of Fish and Game, Subsistence Division
Gay Sheffield	Alaska Department of Fish and Game
James J. Simon	Alaska Department of Fish and Game, Subsistence Division
Art Sowls	United States Fish and Wildlife Service
Alan Springer	University of Alaska, Fairbanks
Marc Webber	United States Fish and Wildlife Service
Tom Weingartner	University of Alaska, Institute of Marine Science
Polly Wheeler	United States Fish and Wildlife Service, Office of Subsistence Management
Terry Whitledge	University of Alaska, Institute of Marine Science
Rebecca Woodgate	University of Washington
Bruce Woods	United States Fish and Wildlife Service