

# Outer Continental Shelf Oil & Gas Leasing Program: 2002-2007

Final Environmental Impact Statement  
April 2002

Volume II

# **Outer Continental Shelf Oil & Gas Leasing Program: 2002-2007**

**Final Environmental Impact Statement  
April 2002**

**Volume II**

**TABLE OF CONTENTS**  
**LIST OF TABLES**

| <b>Table</b> | <b>Page</b>                                                                                                                               |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 3            | Mammals of the Gulf of Mexico ..... 41                                                                                                    |
| 3            | Coastal Birds of the Gulf of Mexico..... 42                                                                                               |
| 3-3.         | Common Taxa Representing Major Shelf and Oceanic Fish Assemblages in the Gulf of Mexico ..... 43                                          |
| 3-4.         | Sea Turtles of the Gulf of Mexico ..... 44                                                                                                |
| 3-5.         | Topographic Features of the Central and Western Gulf of Mexico ..... 45                                                                   |
| 3-6.         | Benthic Zones Characteristic of Western and Central Gulf of Mexico Topographic Features..... 46                                           |
| 3-7.         | Deep-Sea Faunal Zones in the Gulf of Mexico..... 46                                                                                       |
| 3-8.         | Managed Species of Invertebrates and Reeffishes for Which Essential Fish Habitat Has Been Designated in the Gulf of Mexico ..... 47       |
| 3-9.         | Managed Species of Coastal Pelagic Fishes and Red Drum for Which Essential Fish Habitat Has Been Designated in the Gulf of Mexico..... 48 |
| 3-10.        | Managed Highly Migratory Species for Which Essential Fish Habitat Has Been Designated in the Gulf of Mexico..... 49                       |
| 3-11.        | National Wildlife Refuges Along the Gulf of Mexico Coast From Texas Through Florida..... 50                                               |
| 3-12.        | Gulf of Mexico Coastal Population Overview..... 51                                                                                        |
| 3-13.        | Gulf of Mexico Coastal Region Population and Employment Composition ..... 52                                                              |
| 3-14.        | Gulf of Mexico Coastal Commuting Zones Population Projections..... 53                                                                     |
| 3-15.        | Gulf of Mexico Coastal Commuting Zones Labor Force Projections..... 54                                                                    |
| 3-16(a).     | Gulf of Mexico Coastal Commuting Zones Employment Projections..... 55                                                                     |
| 3-16(b).     | Gulf of Mexico Coastal Commuting Zones Earnings Projections..... 56                                                                       |
| 3-17.        | Primary Commercial Fishing Methods, Species Sought, Seasons, and General Areas Fished in the Gulf of Mexico..... 57                       |

| <b>Table</b>                                                                                                                                                                                | <b>Page</b> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 3-18. Employment in Tourism-Related Industries in 1990, Gulf of Mexico Coastal Region.....                                                                                                  | 58          |
| 3-19. Marine Mammals of the Alaska Region.....                                                                                                                                              | 59          |
| 3-20. Terrestrial Mammals That Could Occur Adjacent to Alaska Planning Areas.....                                                                                                           | 60          |
| 3-21. Water Bird Species Occurring in the Alaska Planning Areas.....                                                                                                                        | 61          |
| 3-22. Shorebird Species Occurring in the Alaska Planning Areas.....                                                                                                                         | 62          |
| 3-23. Seabird Species Occurring in the Alaska Planning Areas.....                                                                                                                           | 63          |
| 3-24. Species for Which Essential Fish Habitat Has Been Designated in the Gulf of Alaska and Cook Inlet.....                                                                                | 64          |
| 3-25. Alaska Comparative Population and Income Measures.....                                                                                                                                | 65          |
| 3-26. State of Alaska Population Projections by Age, 1998-2025.....                                                                                                                         | 67          |
| 3-27. Alaska Population and Employment Composition.....                                                                                                                                     | 68          |
| 3-28. Beaufort Sea and Chukchi Sea Planning Areas Population and Employment Composition (North Slope Census Area).....                                                                      | 69          |
| 3-29. Hope Basin Planning Area Population and Employment Composition (Kobuk Census Area).....                                                                                               | 70          |
| 3-30. Cook Inlet Planning Area Population and Employment Composition (Kenai-Cook Inlet Census Area, Kenai Peninsula Borough, Municipality of Anchorage, and Matanuska-Susitna Borough)..... | 71          |
| 3-31. Threatened or Endangered Marine Mammals in the Pacific Region.....                                                                                                                    | 72          |
| 3-32. Marine Resources of Concern in California.....                                                                                                                                        | 73          |
| 4-1a. The Proposed Action (Alternative 1) – Exploration and Development Scenario for the Gulf of Mexico Region.....                                                                         | 75          |
| 4-1b. The Proposed Action (Alternative 1) – Exploration and Development Scenario for the Alaska Region.....                                                                                 | 76          |
| 4-1c. Oil-Spill Rates for Spill Sources.....                                                                                                                                                | 77          |
| 4-1d. Oil-Spill Rates for OCS Planning Areas.....                                                                                                                                           | 77          |
| 4-1e. The Proposed Action (Alternative 1) – Oil-Spill Assumptions.....                                                                                                                      | 78          |

| <b>Table</b>                                                                                                                 | <b>Page</b> |
|------------------------------------------------------------------------------------------------------------------------------|-------------|
| 4-2a. Slow the Pace of Leasing (Alternative 2) – Exploration and Development Scenario for the Gulf of Mexico Region .....    | 79          |
| 4-2b. Slow the Pace of Leasing (Alternative 2) – Exploration and Development Scenario for the Alaska Region .....            | 80          |
| 4-2c. Slow the Pace of Leasing (Alternative 2) – Oil-Spill Assumptions .....                                                 | 81          |
| 4-3a. Exclude Some Planning Areas (Alternative 3) – Exploration and Development Scenario for the Gulf of Mexico Region ..... | 82          |
| 4-3b. Exclude Some Planning Areas (Alternative 3) – Exploration and Development Scenario for the Alaska Region .....         | 83          |
| 4-3c. Exclude Some Planning Areas (Alternative 3) – Oil-Spill Assumptions .....                                              | 84          |
| 4-4a. Accelerated Leasing (Alternative 4) – Exploration and Development Scenario for the Gulf of Mexico Region .....         | 85          |
| 4-4b. Accelerated Leasing (Alternative 4) – Exploration and Development Scenario for the Alaska Region .....                 | 86          |
| 4-4c. Accelerated Leasing (Alternative 4) – Oil-Spill Assumptions .....                                                      | 87          |
| 4-5a. Oil Consumption by End-Use Sector .....                                                                                | 88          |
| 4-5b. Natural Gas Consumption by End-Use Sector .....                                                                        | 88          |
| 4-5c. Most Likely Response to No Action (Alternative 5) .....                                                                | 89          |
| 4-5d. No Action (Alternative 5) – Large Oil-Spill Assumptions .....                                                          | 89          |
| 4-6a. Cumulative Case – Exploration and Development Scenario for the Gulf of Mexico Region .....                             | 90          |
| 4-6b. Cumulative Case – Exploration and Development Scenario for the Alaska Region .....                                     | 91          |
| 4-6c. Cumulative Case – Oil-Spill Assumptions .....                                                                          | 92          |
| 4-7a. Estimated Greenhouse Gas Emission Rates From Proposed 2002-2007 OCS Program Activities .....                           | 93          |
| 4-7b. Estimated Greenhouse Gas Emission Rates From OCS Cumulative Program Activities .....                                   | 93          |

| <b>Table</b>                                                                                                          | <b>Page</b> |
|-----------------------------------------------------------------------------------------------------------------------|-------------|
| 4-8a. Estimated Peak-Year Emissions for Proposed 2002-2007 OCS Program,<br>Western Gulf of Mexico Planning Area ..... | 94          |
| 4-8b. Estimated Peak-Year Emissions for Proposed 2002-2007 OCS Program,<br>Central Gulf of Mexico Planning Area ..... | 94          |
| 4-8c. Estimated Peak-Year Emissions for Proposed 2002-2007 OCS Program,<br>Eastern Gulf of Mexico Planning Area ..... | 95          |
| 4-8d. Estimated Typical Emissions for Activities Under the Proposed 2002-2007<br>OCS Program, Alaska Region .....     | 95          |
| 4-9. Gulf of Mexico Proposed Action Employment and Income Projections .....                                           | 96          |
| 4-10. Gulf of Mexico Proposed Action Sensitive Industry Projections .....                                             | 97          |
| 4-11. Alaska Proposed Action Employment and Income Projections.....                                                   | 103         |
| 4-12. Estimated Average Emissions for the Cumulative OCS Program, Gulf of<br>Mexico Region .....                      | 104         |

## **APPENDICES**

- A. Glossary
- B. Abbreviations and Acronyms
- C. Oil-Spill Response Capabilities for Offshore Oil and Gas Operations
- D. Assumed Mitigation Measures
- E. Federal Laws and Executive Orders
- F. References
- G. Comment Letters

## **TABLES**

---

**Table 3-1. Marine Mammals of the Gulf of Mexico**

| Species                                                      | Status <sup>a</sup> | Occurrence <sup>b</sup> | Typical Habitat |       |            |
|--------------------------------------------------------------|---------------------|-------------------------|-----------------|-------|------------|
|                                                              |                     |                         | Coastal         | Shelf | Slope/Deep |
| <b>ORDER CETACEA</b>                                         |                     |                         |                 |       |            |
| <b>Suborder Mysticeti (baleen whales)</b>                    |                     |                         |                 |       |            |
| Family Balaenidae                                            |                     |                         |                 |       |            |
| <i>Eubalaena glacialis</i> (northern right whale)            | E                   | 1                       | --              | X     | X          |
| Family Balaenopteridae                                       |                     |                         |                 |       |            |
| <i>Balaenoptera musculus</i> (blue whale)                    | E                   | 1                       | --              | X     | X          |
| <i>Balaenoptera edeni</i> (Bryde's whale)                    | --                  | 3                       | --              | X     | X          |
| <i>Balaenoptera physalus</i> (fin whale)                     | E                   | 2                       | --              | X     | X          |
| <i>Megaptera novaeangliae</i> (humpback whale)               | E                   | 2                       | --              | X     | X          |
| <i>Balaenoptera acutorostrata</i> (minke whale)              | --                  | 2                       | --              | X     | X          |
| <i>Balaenoptera borealis</i> (sei whale)                     | E                   | 2                       | --              | X     | X          |
| <b>Suborder Odontoceti (toothed whales and dolphins)</b>     |                     |                         |                 |       |            |
| Family Physeteridae                                          |                     |                         |                 |       |            |
| <i>Kogia simus</i> (dwarf sperm whale)                       | --                  | 3                       | --              | --    | X          |
| <i>Kogia breviceps</i> (pygmy sperm whale)                   | --                  | 3                       | --              | --    | X          |
| <i>Physeter macrocephalus</i> (sperm whale)                  | E                   | 4                       | --              | --    | X          |
| Family Ziphiidae                                             |                     |                         |                 |       |            |
| <i>Mesoplodon densirostris</i> (Blainville's beaked whale)   | --                  | 2 <sup>c</sup>          | --              | --    | X          |
| <i>Ziphius cavirostris</i> (Cuvier's beaked whale)           | --                  | 2 <sup>c</sup>          | --              | --    | X          |
| <i>Mesoplodon europaeus</i> (Gervais' beaked whale)          | --                  | 3 <sup>c</sup>          | --              | --    | X          |
| <i>Mesoplodon bidens</i> (Sowerby's beaked whale)            | --                  | 1 <sup>c</sup>          | --              | --    | X          |
| Family Delphinidae                                           |                     |                         |                 |       |            |
| <i>Stenella frontalis</i> (Atlantic spotted dolphin)         | --                  | 4                       | --              | X     | X          |
| <i>Tursiops truncatus</i> (bottlenose dolphin)               | --                  | 4                       | X               | X     | X          |
| <i>Stenella clymene</i> (clymene dolphin)                    | --                  | 4                       | --              | --    | X          |
| <i>Pseudorca crassidens</i> (false killer whale)             | --                  | 3                       | --              | --    | X          |
| <i>Lagenodelphis hosei</i> (Fraser's dolphin)                | --                  | 4                       | --              | --    | X          |
| <i>Orcinus orca</i> (killer whale)                           | --                  | 3                       | --              | --    | X          |
| <i>Peponocephala electra</i> (melon-headed whale)            | --                  | 4                       | --              | --    | X          |
| <i>Stenella attenuata</i> (pantropical spotted dolphin)      | --                  | 4                       | --              | --    | X          |
| <i>Feresa attenuata</i> (pygmy killer whale)                 | --                  | 3                       | --              | --    | X          |
| <i>Globicephala macrorhynchus</i> (short-finned pilot whale) | --                  | 4                       | --              | --    | X          |
| <i>Grampus griseus</i> (Risso's dolphin)                     | --                  | 4                       | --              | --    | X          |
| <i>Steno bredanensis</i> (rough-toothed dolphin)             | --                  | 4                       | --              | --    | X          |
| <i>Stenella longirostris</i> (spinner dolphin)               | --                  | 4                       | --              | --    | X          |
| <i>Stenella coeruleoalba</i> (striped dolphin)               | --                  | 4                       | --              | --    | X          |
| <b>ORDER SIRENIA (dugongs and manatees)</b>                  |                     |                         |                 |       |            |
| Family Trichechidae                                          |                     |                         |                 |       |            |
| <i>Trichechus manatus</i> (West Indian manatee)              | E                   | 2                       | X               | --    | --         |

<sup>a</sup> Status: E = endangered under the Endangered Species Act of 1973.

<sup>b</sup> occurrence: 1 = extralimital; 2 = rare; 3 = uncommon; 4 = common (adapted from Würsig et al., 2000).

<sup>c</sup> beaked whales in the Gulf of Mexico may be uncommon or common rather than rare or extralimital. Their population status is uncertain because they are difficult to see and identify to species. Most surveys have been conducted in sea states that are not optimal for sighting beaked whales.



**Table 3-2. Marine and Coastal Birds of the Gulf of Mexico**

| Category             | Order                                     | Family Name             | Common Name                    |
|----------------------|-------------------------------------------|-------------------------|--------------------------------|
| <b>Seabirds</b>      |                                           |                         |                                |
|                      | Charadriiformes                           | Laridae                 | gulls and terns                |
|                      |                                           | Scolopacidae            | phalaropes                     |
|                      | Gaviiformes                               | Gaviidae                | loons                          |
|                      | Pelicaniformes                            | Fregatidae              | frigatebirds                   |
|                      |                                           | Pelicanidae             | pelicans                       |
| Phaethontidae        |                                           | tropicbirds             |                                |
| Phalacrocoracidae    |                                           | cormorants              |                                |
| Procellariiformes    | Sulidae                                   | gannets and boobies     |                                |
|                      | Diomedeidae                               | albatrosses             |                                |
|                      | Hydrobatidae                              | storm-petrels           |                                |
|                      | Procellariidae                            | petrels and shearwaters |                                |
| <b>Shorebirds</b>    |                                           |                         |                                |
|                      | Charadriiformes                           | Charadriidae            | plovers                        |
|                      |                                           | Haematopodidae          | oystercatchers                 |
|                      |                                           | Recurvirostridae        | stilts and avocets             |
|                      |                                           | Scolopacidae            | sandpipers, snipes, and allies |
| <b>Wetland Birds</b> |                                           |                         |                                |
|                      | Charadriiformes                           | Jacanidae               | jacanas                        |
|                      | Ciconiiformes                             | Aramidae                | limkins                        |
|                      |                                           | Ardeidae                | bitterns, egrets, and herons   |
|                      |                                           | Ciconiidae              | storks                         |
|                      | Gruiformes                                | Threskiornithidae       | ibises and spoonbills          |
|                      |                                           | Gruidae                 | cranes                         |
| Rallidae             | rails and coots, moorhens, and gallinules |                         |                                |
| Pelicaniformes       | Anhingidae                                | darters and anhingas    |                                |
| Podicipediformes     | Podicipedidae                             | grebes                  |                                |
| <b>Waterfowl</b>     |                                           |                         |                                |
|                      | Anseriformes                              | Anatidae                | ducks, geese, and swans        |

**Table 3-3. Common Taxa Representing Major Shelf and Oceanic Fish Assemblages in the Gulf of Mexico**

| Category              | Assemblage                      | Common Name                                                                                                     | Scientific Name                                                                                                                                                                              |
|-----------------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Shelf Fishes</b>   |                                 |                                                                                                                 |                                                                                                                                                                                              |
|                       | soft bottom<br>pink shrimp      | dusky flounder<br>sand perch<br>silver jenny<br>pigfish<br>Atlantic bumper                                      | <i>Syacium papillosum</i><br><i>Diplectrum formosum</i><br><i>Eucinostomus gula</i><br><i>Orthopristis chrysoptera</i><br><i>Chloroscombrus chrysurus</i>                                    |
|                       | brown shrimp                    | longspine porgy<br>horned sea robin<br>leopard sea robin<br>dwarf goatfish                                      | <i>Stenotomus caprinus</i><br><i>Bellator militaris</i><br><i>Prionotus scitulus</i><br><i>Upeneus parvus</i>                                                                                |
|                       | white shrimp                    | Atlantic croaker<br>star drum<br>Atlantic cutlassfish<br>sand sea trout<br>silver sea trout<br>hardhead catfish | <i>Micropogonias undulatus</i><br><i>Stellifer lanceolatus</i><br><i>Trichiurus lepturus</i><br><i>Cynoscion arenarius</i><br><i>Cynoscion nothus</i><br><i>Arius felis</i>                  |
|                       | hard bottom<br>( < 50 m depths) | tomtate<br>red snapper<br>gag<br>bank sea bass<br>blue angelfish<br>gray triggerfish                            | <i>Haemulon aurolineatum</i><br><i>Lutjanus campechanus</i><br><i>Mycteroperca microlepis</i><br><i>Centropristis ocyurus</i><br><i>Holacanthus bermudensis</i><br><i>Balistes capriscus</i> |
|                       | (> 50 m depths)                 | rougtongue bass<br>bank butterflyfish<br>scamp<br>tattler<br>short bigeye                                       | <i>Pronotogrammus martinicensis</i><br><i>Chaetodon aya</i><br><i>Mycteroperca phenax</i><br><i>Serranus phoebe</i><br><i>Pristigenys alta</i>                                               |
|                       | coastal pelagic                 | Spanish mackerel<br>king mackerel<br>cobia<br>crevalle jack<br>bluefish                                         | <i>Scomberomorus maculatus</i><br><i>Scomberomorus cavalla</i><br><i>Rachycentron canadum</i><br><i>Caranx hippos</i><br><i>Pomatomus saltatrix</i>                                          |
| <b>Oceanic Fishes</b> |                                 |                                                                                                                 |                                                                                                                                                                                              |
|                       | epipelagic                      | blue marlin<br>yellowfin tuna<br>dolphin<br>wahoo<br>swordfish                                                  | <i>Makaira nigricans</i><br><i>Thunnus albacares</i><br><i>Coryphaena hippurus</i><br><i>Acanthocybium solanderi</i><br><i>Xiphias gladius</i>                                               |
|                       | midwater                        | bristlemouths<br>lanternfishes<br>hatchetfishes                                                                 | Gonostomatidae<br>Myctophidae<br>Sternoptychidae                                                                                                                                             |
|                       | demersal                        | grenadiers<br>cusk-eels<br>hakes<br>eels                                                                        | Macrouridae<br>Ophidiidae<br>Gadidae<br>Synaphobranchidae                                                                                                                                    |

Table 3-4. Sea Turtles of the Gulf of Mexico

| Species                                           | Status           | Typical Adult Habitat                                                                       | Juvenile/Hatchlings Potentially Present? | Nesting                                                                                                                                  |
|---------------------------------------------------|------------------|---------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Family Cheloniidae</b>                         |                  |                                                                                             |                                          |                                                                                                                                          |
| <i>Caretta caretta</i> (loggerhead turtle)        | T                | estuarine, coastal, and shelf waters                                                        | Yes                                      | some nesting along northern Gulf Coast; main U.S. nesting beaches are in southeast Florida                                               |
| <i>Chelonia mydas</i> (green turtle)              | T,E <sup>a</sup> | shallow coastal waters, seagrass beds                                                       | Yes                                      | isolated and infrequent nesting in northern Gulf                                                                                         |
| <i>Eretmochelys imbricata</i> (hawksbill turtle)  | E                | coral reefs, hard bottom areas in coastal waters; adults not often sighted in northern Gulf | Yes                                      | nesting in continental U.S. is limited to southeastern Florida and Florida Keys                                                          |
| <i>Lepidochelys kempii</i> (Kemp's ridley turtle) | E                | shallow coastal waters, seagrass beds                                                       | Yes                                      | nests mainly at Rancho Nuevo, Mexico; minor nesting on Padre and Mustang Islands, Texas                                                  |
| <b>Family Dermochelyidae</b>                      |                  |                                                                                             |                                          |                                                                                                                                          |
| <i>Dermochelys coriacea</i> (leatherback turtle)  | E                | slope, shelf, and coastal waters; considered the most "pelagic" of the sea turtles          | Yes                                      | some nesting in northern Gulf, especially Florida Panhandle; nearest major nesting concentrations are in Caribbean and southeast Florida |

Status: E = endangered species and T = threatened species under the Endangered Species Act of 1973.

<sup>a</sup> Green sea turtles are listed as threatened except for Florida where breeding populations are listed as endangered.

**Table 3-5. Topographic Features of the Central and Western Gulf of Mexico**

| <b>Shelf Edge Banks</b> | <b>Midshelf Banks</b> | <b>South Texas Banks</b> |
|-------------------------|-----------------------|--------------------------|
| Bright Bank             | Sonnier Bank          | Mysterious Bank          |
| McGrail Bank            | 29 Fathom Bank        | Baker Bank               |
| Rankin Bank             | Fishnet Bank          | Aransas Bank             |
| Alderdice Bank          | Claypile Lump         | Southern Bank            |
| Rezak Bank              | 32 Fathom Bank        | North Hospital Bank      |
| Sidner Bank             | Coffee Lump           | Hospital Bank            |
| Ewing Bank              | Stetson Bank          | South Baker Bank         |
| Jakkula Bank            |                       | Dream Bank               |
| Bouma Bank              |                       | Blackfish Ridge          |
| Parker Bank             |                       | Big Dunn Bar             |
| Sackett Bank            |                       | Small Dunn Bar           |
| Diaphus Bank            |                       |                          |
| Sweet Bank              |                       |                          |
| East Flower Garden Bank |                       |                          |
| West Flower Garden Bank |                       |                          |
| Geyer Bank              |                       |                          |
| Elvers Bank             |                       |                          |
| MacNeil Bank            |                       |                          |
| Applebaum Bank          |                       |                          |

Source: USDOJ, MMS (1996a).

**Table 3-6. Benthic Zones Characteristic of Western and Central Gulf of Mexico Topographic Features**

| <b>Benthic Zone</b>                | <b>Depth Range</b> | <b>Description</b>                                                                |
|------------------------------------|--------------------|-----------------------------------------------------------------------------------|
| <i>Diploria-Montastrea-Porites</i> | < 20 – 36 m        | diverse community of hermatypic corals and coralline algae                        |
| <i>Madracis</i> and leafy algae    | 28 – 46 m          | branching coral <i>Madracis mirabilis</i> and various species of leafy algae      |
| <i>Stephanocoenia-Millepora</i>    | 36 – 52 m          | less diverse community of hermatypic corals and coralline algae                   |
| algal-sponge                       | 55 – 85 m          | coralline algae producing algal nodules with abundant leafy algae and sponges     |
| <i>Millepora</i> -sponge           | < 20 – 36 m        | hydrocoral <i>Millepora</i> sp. and various sponges abundant                      |
| antipatharian                      | 85 – 90 m          | antipatharians and crinoids most abundant fauna                                   |
| nepheloid                          | > 90 m             | highly turbid zone with occasional deepwater octocorals and solitary stony corals |

Source: Rezak et al. (1983).

**Table 3-7. Deep-Sea Faunal Zones in the Gulf of Mexico**

| <b>Faunal Assemblage</b>    | <b>Depth Range</b> |
|-----------------------------|--------------------|
| Shelf/Slope Transition Zone | 300 – 500 m        |
| Upper Archibenthal Zone     | 500 – 800 m        |
| Lower Archibenthal Zone     | 800 – 1,650 m      |
| Upper Abyssal Zone          | 1,650 – 2,250 m    |
| Mesoabyssal Zone            | 2,250 – 3,000 m    |

Source: Gallaway and Kennicutt (1988).

**Table 3-8. Managed Species of Invertebrates and Reeffishes for Which Essential Fish Habitat Has Been Designated in the Gulf of Mexico**

| Species                                               | Life Stages<br>(Reproductive Activity) | Habitat                              |
|-------------------------------------------------------|----------------------------------------|--------------------------------------|
| <b>Invertebrates</b>                                  |                                        |                                      |
| brown shrimp ( <i>Penaeus aztecus</i> )               | adults; larvae                         | soft bottom; pelagic                 |
| white shrimp ( <i>Penaeus setiferus</i> )             | adults; larvae                         | soft bottom; pelagic                 |
| pink shrimp ( <i>Penaeus duorarum</i> )               | adults; larvae                         | soft bottom; pelagic                 |
| STONE CRAB ( <i>MENIPPE SPP.</i> )                    | adults; larvae                         | soft bottom; pelagic                 |
| SPINY LOBSTER ( <i>PANULIRUS ARGUS</i> )              | adults; larvae                         | hard bottom; pelagic                 |
| ROYAL RED SHRIMP ( <i>HYMENOPENAEUS ROBUSTUS</i> )    | adults; larvae                         | soft bottom; pelagic                 |
| <b>Reeffish</b>                                       |                                        |                                      |
| red grouper ( <i>Epinephelus morio</i> )              | adults and juveniles; eggs and larvae  | hard bottom; pelagic                 |
| gag ( <i>Mycteroperca microlepis</i> )                | adults and juveniles; eggs and larvae  | hard bottom; pelagic                 |
| scamp ( <i>Mycteroperca phenax</i> )                  | adults and juveniles; eggs and larvae  | hard bottom; pelagic                 |
| red snapper ( <i>Lutjanus campechanus</i> )           | adults; juveniles; eggs and larvae     | hard bottom;<br>soft bottom; pelagic |
| lane snapper ( <i>Lutjanus synagris</i> )             | adults and juveniles; eggs and larvae  | hard bottom; pelagic                 |
| yellowtail snapper ( <i>Ocyurus chrysurus</i> )       | adults and juveniles; eggs and larvae  | hard bottom; pelagic                 |
| tilefish ( <i>Lopholatilus chamaeleonticeps</i> )     | adults and juveniles; eggs and larvae  | soft bottom; pelagic                 |
| greater amberjack ( <i>Seriola dumerili</i> )         | adults and juveniles; eggs and larvae  | hard bottom; pelagic                 |
| lesser amberjack ( <i>Seriola fasciata</i> )          | adults and juveniles; eggs and larvae  | hard bottom; pelagic                 |
| gray triggerfish ( <i>Balistes capriscus</i> )        | adults; eggs; larvae and juveniles     | hard bottom; pelagic                 |
| black grouper ( <i>Mycteroperca bonaci</i> )          | adults; eggs; larvae and juveniles     | hard bottom; pelagic                 |
| vermillion snapper ( <i>Rhomboplites aurorubens</i> ) | adults; eggs; larvae and juveniles     | hard bottom; pelagic                 |
| gray snapper ( <i>Lutjanus griseus</i> )              | adults; eggs; larvae and juveniles     | hard bottom; pelagic                 |

Source: Gulf of Mexico Fishery Management Council (1998).

**Table 3-9. Managed Species of Coastal Pelagic Fishes and Red Drum for Which Essential Fish Habitat Has Been Designated in the Gulf of Mexico**

| Species                                             | Life Stages<br>(Reproductive Activity)                        | Habitat                 |
|-----------------------------------------------------|---------------------------------------------------------------|-------------------------|
| <b>Coastal Pelagic Fishes</b>                       |                                                               |                         |
| cobia ( <i>Rachycentron canadum</i> )               | adults; juveniles/subadults; larvae and eggs                  | pelagic                 |
| king mackerel ( <i>Scomberomorus cavalla</i> )      | adults; juveniles/subadults; larvae and eggs (spawning area)  | pelagic                 |
| Spanish mackerel ( <i>Scomberomorus maculatus</i> ) | adults; juveniles/subadults; larvae and eggs (spawning area)  | pelagic                 |
| dolphin ( <i>Coryphaena hippurus</i> )              | adults; juveniles/subadults; larvae and eggs (spawning area)  | pelagic                 |
| bluefish ( <i>Pomatomus saltatrix</i> )             | adults; juveniles/subadults; larvae and eggs (spawning area)) | pelagic                 |
| little tunny ( <i>Euthynnus alletteratus</i> )      | adults; juveniles/subadults; larvae and eggs (spawning area)  | pelagic                 |
| <b>Red Drum</b>                                     |                                                               |                         |
| red drum ( <i>Sciaenops ocellatus</i> )             | adults; larvae and eggs (spawning area)                       | soft bottom;<br>pelagic |

Source: Gulf of Mexico Fishery Management Council (1998).

**Table 3-10. Managed Highly Migratory Species for Which Essential Fish Habitat Has Been Designated in the Gulf of Mexico**

| Species                                                        | Life Stages<br>(Reproductive Activity)                       | Habitat |
|----------------------------------------------------------------|--------------------------------------------------------------|---------|
| <b>Swordfish</b>                                               |                                                              |         |
| swordfish ( <i>Xiphias gladius</i> )                           | adults; larvae and eggs (spawning area)                      | pelagic |
| <b>Tuna</b>                                                    |                                                              |         |
| skipjack tuna ( <i>Katsuwonus pelamis</i> )                    | adults; larvae and eggs (spawning area)                      | pelagic |
| yellowfin tuna ( <i>Thunnus albacares</i> )                    | adults; juveniles/subadults; larvae and eggs (spawning area) | pelagic |
| bluefin tuna ( <i>Thunnus thynnus</i> )                        | adults; larvae and eggs (spawning area)                      | pelagic |
| <b>Sharks</b>                                                  |                                                              |         |
| nurse shark ( <i>Ginglymostoma cirratum</i> )                  | adults; late juvenile/subadult; neonates/early juveniles     | pelagic |
| longfin mako shark ( <i>Isurus paucus</i> )                    | adults; late juvenile/subadult; neonates/early juveniles     | pelagic |
| blacknose shark ( <i>Carcharhinus acronotus</i> )              | adults; late juvenile/subadult; neonates/early juveniles     | pelagic |
| spinner shark ( <i>Carcharhinus brevipinna</i> )               | late juvenile/subadult                                       | pelagic |
| silky shark ( <i>Carcharhinus falciformis</i> )                | adults; late juvenile/subadult; neonates/early juveniles     | pelagic |
| bull shark ( <i>Carcharhinus leucas</i> )                      | adults; late juvenile/subadult; neonates/early juveniles     | pelagic |
| blacktip shark ( <i>Carcharhinus limbatus</i> )                | late juveniles/subadults                                     | pelagic |
| dusky shark ( <i>Carcharhinus obscurus</i> )                   | neonates/early juveniles                                     | pelagic |
| Caribbean reef shark ( <i>Carcharhinus perezi</i> )            | adult; late juveniles/subadults                              | pelagic |
| sandbar shark ( <i>Carcharhinus plumbeus</i> )                 | adults; late juvenile/subadult; neonates/early juveniles     | pelagic |
| tiger shark ( <i>Galeocerdo cuvieri</i> )                      | adults; late juvenile/subadult; neonates/early juveniles     | pelagic |
| lemon shark ( <i>Negaprion brevirostris</i> )                  | adults; late juvenile/subadult; neonates/early juveniles     | pelagic |
| scalloped hammerhead ( <i>Sphyrna lewini</i> )                 | adults; late juvenile/subadults                              | pelagic |
| great hammerhead ( <i>Sphyrna mokarran</i> )                   | adults; late juvenile/subadults                              | pelagic |
| bonnethead ( <i>Sphyrna tiburo</i> )                           | adults; late juvenile/subadult; neonates/early juveniles     | pelagic |
| Atlantic sharpnose shark ( <i>Rhizoprionodon terraenovae</i> ) | adults; late juvenile/subadult; neonates/early juveniles     | pelagic |

Source: USDOC, NMFS (1999).



**Table 3-11. National Wildlife Refuges Along the Gulf of Mexico Coast From Texas Through Florida**

| National Wildlife Refuge Name | Total Area (ha) | Includes Wetlands |
|-------------------------------|-----------------|-------------------|
| <b>Texas</b>                  |                 |                   |
| Laguna Atascosa               | 23,402          | +                 |
| Aransas                       | 46,296          | +                 |
| San Bernard                   | 12,249          | +                 |
| Brazoria                      | 17,767          | +                 |
| Anahuac                       | 13,880          | +                 |
| Texas Point                   | 3,623           | +                 |
| <b>Louisiana</b>              |                 |                   |
| Shell Keys                    | 3               | -                 |
| Bayou Sauvage                 | 9,009           | +                 |
| Delta                         | 19,749          | +                 |
| Breton                        | 3,661           | +                 |
| <b>Mississippi</b>            |                 |                   |
| Grand Bay                     | 2,072           | +                 |
| <b>Alabama</b>                |                 |                   |
| Grand Bay                     | 1,010           | +                 |
| Bon Secour                    | 2,703           | +                 |
| <b>Florida</b>                |                 |                   |
| St. Vincent                   | 5,055           | +                 |
| St. Marks                     | 27,164          | +                 |
| Cedar Keys                    | 361             | +                 |
| Chassahowitzka                | 12,482          | +                 |
| Pinellas                      | 160             | +                 |
| Egmont Key                    | 133             | -                 |
| Passage Key                   | 26              | -                 |
| Matlacha Pass                 | 159             | +                 |
| Island Bay                    | 8               | +                 |
| Pine Island                   | 244             | +                 |
| J.N. Ding Darling             | 2,556           | +                 |
| Ten Thousand Islands          | 14,178          | +                 |
| Caloosahatchee                | 16              | +                 |
| Key West                      | 84,302          | +                 |
| Great White Heron             | 77,939          | +                 |
| National Key Deer             | 3,486           | +                 |
| Crocodile Lake                | 2,707           | +                 |

Sources: National Audubon Society (2001); U.S. Department of the Interior, Fish and Wildlife Service (2001).

**Table 3-12. Gulf of Mexico Coastal Population Overview**

| <b>State</b> | <b>1970</b> | <b>1980</b> | <b>1990</b> | <b>1999</b> |
|--------------|-------------|-------------|-------------|-------------|
| Texas        | 3,565,529   | 4,832,892   | 5,640,750   | 6,778,314   |
| Louisiana    | 2,632,415   | 3,072,924   | 3,119,663   | 3,276,906   |
| Mississippi  | 296,851     | 368,852     | 388,725     | 447,024     |
| Alabama      | 435,958     | 502,814     | 534,425     | 597,685     |
| Florida      | 4,428,247   | 6,365,036   | 8,131,722   | 9,393,160   |

**Table 3-13. Gulf of Mexico Coastal Region Population and Employment Composition**

| <b>Population Variable</b>                 | <b>1970</b> | <b>1980</b> | <b>1990</b> | <b>1999</b>                 |
|--------------------------------------------|-------------|-------------|-------------|-----------------------------|
| total population                           | 11,359,000  | 15,142,518  | 17,815,285  | 20,432,908                  |
| percent change from previous period        | --          | 33.31       | 17.65       | 14.69                       |
| <b>Population Variable</b>                 | <b>1970</b> | <b>1980</b> | <b>1990</b> | <b>% change (1970-1990)</b> |
| <b>Age Structure (%)</b>                   |             |             |             |                             |
| 0 – 5                                      | 8.5         | 7.4         | 8.9         | 3.89                        |
| 6 – 15                                     | 20.7        | 15.8        | 14.3        | -30.57                      |
| 16 – 17                                    | 5.7         | 5.1         | 2.8         | -51.95                      |
| 18 – 24                                    | 11.2        | 12.8        | 9.8         | -12.46                      |
| 25 – 34                                    | 12.0        | 16.3        | 17.1        | 42.67                       |
| 35 – 44                                    | 11.2        | 11.0        | 14.6        | 30.11                       |
| 45 – 54                                    | 10.7        | 9.7         | 10.1        | -6.23                       |
| 55 – 64                                    | 9.2         | 9.5         | 8.7         | -5.86                       |
| 65+                                        | 10.7        | 12.5        | 13.8        | 28.44                       |
| <b>Race and Ethnic Composition (%)</b>     |             |             |             |                             |
| Black                                      | 18.4        | 17.2        | 17.1        | -6.97                       |
| Hispanic                                   | 9.7         | 13.4        | 17.2        | 77.55                       |
| White                                      | 71.6        | 68.2        | 63.7        | -10.99                      |
| Other                                      | 0.3         | 1.2         | 1.9         | 510.42                      |
| <b>Education of Persons Age 25+ (%)</b>    |             |             |             |                             |
| 0 – 8 years schooling                      | 31.9        | 20.5        | 13.3        | -58.20                      |
| 9 – 11 years schooling                     | 20.1        | 15.8        | 16.8        | -16.06                      |
| high school graduates                      | 27.2        | 32.1        | 30.3        | 11.24                       |
| 13 – 15 years schooling                    | 10.6        | 16.0        | 20.0        | 89.07                       |
| college graduates                          | 10.2        | 15.7        | 19.5        | 90.50                       |
| <b>Labor Force Size</b>                    |             |             |             |                             |
| civilian                                   | 3,983,979   | 6,363,346   | 7,747,442   | 94.46                       |
| military                                   | 119,341     | 81,664      | 95,819      | -19.71                      |
| total                                      | 4,103,320   | 6,445,010   | 7,843,261   | 91.14                       |
| <b>Employment by Industrial Sector (%)</b> |             |             |             |                             |
| agriculture, forestry, mining              | 5.7         | 5.8         | 4.0         | -29.75                      |
| construction                               | 8.9         | 10.6        | 7.6         | -14.74                      |
| business services                          | 3.6         | 5.3         | 5.4         | 49.43                       |
| communications, utilities                  | 3.5         | 3.6         | 2.9         | -18.18                      |
| nondurable manufacturing                   | 8.9         | 8.3         | 5.9         | -33.63                      |
| durable manufacturing                      | 7.8         | 8.9         | 6.1         | -21.43                      |
| finance, insurance, real estate            | 5.3         | 7.3         | 6.9         | 32.17                       |
| services                                   | 29.0        | 19.0        | 33.2        | 14.69                       |
| wholesale, retail trade                    | 22.8        | 25.4        | 23.1        | 1.26                        |
| transportation                             | 4.5         | 5.8         | 4.8         | 6.13                        |
| <b>Employment by Occupation Group (%)</b>  |             |             |             |                             |
| management, professional                   | 10.5        | 12.8        | 14.5        | 37.75                       |
| technical                                  | 1.6         | 3.8         | 4.6         | 181.52                      |
| sales                                      | 9.3         | 13.5        | 16.1        | 73.28                       |
| clerical                                   | 19.9        | 20.1        | 19.3        | -2.94                       |
| precision craft                            | 17.6        | 17.7        | 14.6        | -16.85                      |
| operative, transportation                  | 11.7        | 7.4         | 5.6         | -51.91                      |
| service, except household                  | 16.8        | 15.3        | 17.0        | 1.31                        |
| farming, fishing, forestry                 | 2.9         | 2.7         | 2.7         | -6.93                       |
| household service                          | 3.0         | 1.0         | 0.8         | -73.91                      |
| laborers                                   | 6.6         | 5.8         | 4.8         | -28.16                      |

Note: Data for 1999, other than total population, were not available at the time of this report.

**Table 3-14. Gulf of Mexico Coastal Commuting Zones Population Projections**

| Year | Age Group |            |           |            |           |            |           |            | Total Population* | 5-Year Growth Rate |
|------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-------------------|--------------------|
|      | 0-19      |            | 20-34     |            | 35-64     |            | 65+       |            |                   |                    |
|      | Number    | % of Total | Number    | % of Total | Number    | % of Total | Number    | % of Total |                   |                    |
| 1980 | 4,816,860 | 31.7       | 3,862,580 | 25.5       | 4,592,630 | 30.3       | 1,904,190 | 12.6       | 15,176,260        | –                  |
| 1985 | 4,982,390 | 29.6       | 4,367,210 | 26.0       | 5,298,300 | 31.5       | 2,163,390 | 12.9       | 16,811,290        | 10.8               |
| 1990 | 5,226,510 | 29.2       | 4,286,390 | 24.0       | 5,905,400 | 33.0       | 2,464,370 | 13.8       | 17,882,670        | 6.4                |
| 1995 | 5,629,340 | 29.1       | 4,162,360 | 21.5       | 6,857,030 | 35.4       | 2,706,100 | 14.0       | 19,354,830        | 8.2                |
| 2000 | 5,957,170 | 28.8       | 4,004,280 | 19.4       | 7,840,400 | 37.9       | 2,880,080 | 13.9       | 20,681,930        | 6.9                |
| 2005 | 6,134,000 | 27.9       | 4,175,000 | 19.0       | 8,587,000 | 39.1       | 3,058,000 | 13.9       | 21,964,000        | 6.2                |
| 2010 | 6,310,000 | 27.1       | 4,464,000 | 19.2       | 9,091,000 | 39.1       | 3,410,000 | 14.7       | 23,275,000        | 6.0                |
| 2015 | 6,491,000 | 26.4       | 4,786,000 | 19.4       | 9,338,000 | 37.9       | 4,005,000 | 16.3       | 24,620,000        | 5.8                |
| 2020 | 6,789,000 | 26.2       | 4,904,000 | 18.9       | 9,501,000 | 36.6       | 4,465,000 | 17.2       | 25,938,000        | 5.4                |

\*Mid-year estimates (July 1) for each year.

**Table 3-15. Gulf of Mexico Coastal Commuting Zones Labor Force Projections**

| Year | Age Group |            |           |            |           |            |         |            | Total Population* | 5-Year Growth Rate |
|------|-----------|------------|-----------|------------|-----------|------------|---------|------------|-------------------|--------------------|
|      | 16-19     |            | 20-34     |            | 35-64     |            | 65+     |            |                   |                    |
|      | Number    | % of Total | Number    | % of Total | Number    | % of Total | Number  | % of Total |                   |                    |
| 1980 | 1,090,910 | 14.3       | 3,062,470 | 40.2       | 3,242,640 | 42.6       | 222,040 | 2.9        | 7,618,060         | --                 |
| 1985 | 1,021,320 | 11.8       | 3,550,360 | 41.1       | 3,851,770 | 44.6       | 210,900 | 2.4        | 8,634,350         | 13.3               |
| 1990 | 1,010,010 | 10.9       | 3,514,000 | 37.9       | 4,490,930 | 48.4       | 261,230 | 2.8        | 9,276,170         | 7.4                |
| 1995 | 1,071,650 | 10.7       | 3,398,080 | 33.9       | 5,269,120 | 52.5       | 292,910 | 2.9        | 10,031,760        | 8.2                |
| 2000 | 1,213,080 | 11.2       | 3,274,170 | 30.1       | 6,105,980 | 56.1       | 290,150 | 2.7        | 10,883,380        | 8.5                |
| 2005 | 1,291,000 | 11.1       | 3,413,000 | 29.2       | 6,662,000 | 57.1       | 314,000 | 2.7        | 11,681,000        | 7.3                |
| 2010 | 1,365,000 | 11.1       | 3,650,000 | 29.6       | 6,938,000 | 56.3       | 370,000 | 3.0        | 12,324,000        | 5.5                |
| 2015 | 1,323,000 | 10.4       | 3,915,000 | 30.8       | 7,026,000 | 55.2       | 465,000 | 3.7        | 12,729,000        | 3.3                |
| 2020 | 1,357,000 | 10.4       | 4,017,000 | 30.9       | 7,082,000 | 54.4       | 556,000 | 4.3        | 13,012,000        | 2.2                |

\*Mid-year estimates (July 1) of working age population, for each year.

**Table 3-16a. Gulf of Mexico Coastal Commuting Zones Employment Projections**

| <b>Industry</b>                    | <b>2000</b>    | <b>2005</b>    | <b>2010</b>    | <b>2015</b>    | <b>2020</b>    | <b>% Change<br/>(2000-2020)</b> |
|------------------------------------|----------------|----------------|----------------|----------------|----------------|---------------------------------|
| all-industry total                 | 13,515,460     | 14,431,000     | 15,259,000     | 15,927,000     | 16,502,000     | 22.1                            |
| farm                               | 225,790        | 223,000        | 220,000        | 216,000        | 200,000        | -11.3                           |
| non-farm                           | 13,579,900     | 14,509,000     | 15,357,000     | 16,052,000     | 16,668,000     | 22.7                            |
| private                            | 11,546,800     | 12,379,000     | 13,139,000     | 13,762,000     | 14,329,000     | 24.1                            |
| agric. services, forestry          | 222,200        | 246,000        | 267,000        | 283,000        | 299,000        | 34.6                            |
| mining                             | 149,320        | 142,000        | 137,000        | 132,000        | 122,000        | -18.5                           |
| <b>oil and gas</b>                 | <b>143,490</b> | <b>136,000</b> | <b>131,000</b> | <b>126,000</b> | <b>116,000</b> | <b>-19.0</b>                    |
| construction                       | 853,190        | 903,000        | 949,000        | 985,000        | 1,011,000      | 18.5                            |
| manufacturing                      | 1,066,780      | 1,072,000      | 1,080,000      | 1,086,000      | 1,068,000      | 0.1                             |
| durables                           | 514,580        | 512,000        | 511,000        | 510,000        | 496,000        | -3.6                            |
| nondurables                        | 552,140        | 560,000        | 569,000        | 576,000        | 572,000        | 3.6                             |
| transportation & utilities         | 648,470        | 681,000        | 709,000        | 731,000        | 744,000        | 14.7                            |
| wholesale trade                    | 623,500        | 659,000        | 688,000        | 708,000        | 719,000        | 15.3                            |
| retail trade                       | 2,470,450      | 2,620,000      | 2,767,000      | 2,879,000      | 2,966,000      | 20.1                            |
| finance, insurance,<br>real estate | 946,490        | 994,000        | 1,037,000      | 1,073,000      | 1,100,000      | 16.2                            |
| services                           | 4,566,040      | 5,062,000      | 5,505,000      | 5,884,000      | 6,300,000      | 38.0                            |
| Government                         | 2,033,210      | 2,131,000      | 2,218,000      | 2,290,000      | 2,339,000      | 15.0                            |
| Federal civilian                   | 207,940        | 207,000        | 206,000        | 206,000        | 200,000        | -3.7                            |
| military                           | 212,190        | 211,000        | 212,000        | 213,000        | 213,000        | 0.5                             |
| State and local                    | 1,612,920      | 1,712,000      | 1,800,000      | 1,871,000      | 1,925,000      | 19.4                            |

**Table 3-16b. Gulf of Mexico Coastal Commuting Zones Earnings Projections  
(in 1987 \$millions)**

| <b>Industry</b>                    | <b>2000</b> | <b>2005</b> | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>% Change<br/>(2000-2020)</b> |
|------------------------------------|-------------|-------------|-------------|-------------|-------------|---------------------------------|
| all-industry total                 | 21,820      | 24,000      | 27,000      | 28,000      | 30,000      | 39.2%                           |
| farm                               | 256         | 270         | 280         | 280         | 270         | 6.1%                            |
| non-farm                           | 22,181      | 25,000      | 27,000      | 29,000      | 31,000      | 39.7%                           |
| private                            | 18,344      | 20,000      | 23,000      | 24,000      | 26,000      | 41.6%                           |
| agric. services, forestry          | 215         | 250         | 290         | 320         | 350         | 62.5%                           |
| mining                             | 468         | 460         | 460         | 460         | 440         | -5.3%                           |
| <b>oil and gas</b>                 | <b>274</b>  | <b>270</b>  | <b>260</b>  | <b>260</b>  | <b>250</b>  | <b>-9.5%</b>                    |
| construction                       | 1,796       | 2,000       | 2,200       | 2,300       | 2,500       | 38.6%                           |
| manufacturing                      | 2,449       | 2,600       | 2,700       | 2,800       | 2,900       | 18.1%                           |
| durables                           | 1,046       | 1,100       | 1,100       | 1,200       | 1,200       | 14.9%                           |
| nondurables                        | 1,361       | 1,400       | 1,500       | 1,500       | 1,600       | 16.2%                           |
| transportation & utilities         | 812         | 900         | 900         | 1,000       | 1,000       | 24.4%                           |
| wholesale trade                    | 1,398       | 1,500       | 1,600       | 1,700       | 1,800       | 30.0%                           |
| retail trade                       | 2,299       | 2,500       | 2,700       | 2,800       | 2,900       | 27.4%                           |
| finance, insurance,<br>real estate | 1,578       | 1,800       | 2,000       | 2,200       | 2,400       | 50.4%                           |
| services                           | 6,983       | 8,000       | 9,000       | 10,000      | 11,000      | 61.0%                           |
| Government                         | 3,677       | 4,000       | 4,300       | 4,600       | 4,900       | 32.0%                           |
| Federal civilian                   | 547         | 600         | 600         | 600         | 600         | 10.9%                           |
| military                           | 289         | 300         | 310         | 330         | 330         | 15.6%                           |
| State and local                    | 2,795       | 3,100       | 3,400       | 3,600       | 3,900       | 38.0%                           |

**Table 3-17. Primary Commercial Fishing Methods, Species Sought, Seasons, and General Areas Fished in the Gulf of Mexico**

| <b>Fishing Method</b>                         | <b>Species Sought</b>                                                                             | <b>Primary Fishing Season</b>                                                 | <b>Primary Fishing Area</b>                                                        |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| bottom trawling                               | brown shrimp, pink shrimp, white shrimp, seabob, royal red shrimp, and groundfishes               | year-round, depending on species and seasonal closures                        | soft bottom, shelf waters offshore all Gulf States                                 |
| purse seining                                 | menhaden, butterfish, scads, blue runner, and spanish sardines                                    | spring and summer months                                                      | menhaden off Louisiana and Mississippi, scads and sardines off Florida Panhandle   |
| gillnetting                                   | coastal sharks, mullet, black drum                                                                | spring and summer, depending on species and seasonal closures                 |                                                                                    |
| hook-and-lining (bottom fishing and trolling) | snappers, groupers, amberjacks, triggerfishes, sharks, king mackerel, Spanish mackerel, and cobia | year-round; effort varies with species-specific closures                      | oil platforms, artificial reefs, and natural hard-bottom areas throughout the Gulf |
| surface longlining                            | sharks, swordfish, tunas, and dolphinfish                                                         | year-round with summer peaks                                                  | open Gulf seaward of 200 m                                                         |
| bottom longlining                             | groupers, snappers, tilefishes, and sharks                                                        | year-round; effort varies with species-specific closures                      | outer shelf waters from Florida to Texas on suitable bottom type                   |
| trapping                                      | spiny lobster, stone crab, and reef fishes                                                        | stone crab (Oct. to Mar.); spiny lobster (July to March); fishes (year-round) | Florida shelf waters                                                               |

Bottom trawling: a large net held open at the entrance by “doors” is dragged along the bottom or up in the water column behind a towing vessel.

Purse seining: a long rectangular net with a weighted bottom edge and buoyant top, floated by the cork line, is run around a school of fish. The line running along the bottom edge of the net is hauled in closing the bottom of the net and trapping the fish.

Gillnetting: nets used range from several hundred to several thousand feet in length. The size of the mesh in a gillnet reduces the amount of bycatch by allowing most smaller fish to swim through the openings.

Longlining: a continuous mainline supported by float lines (mainline may be surface or subsurface) with regularly spaced leaders with an additional section of monofilament line perpendicular to the mainline, each ending with a baited hook.



**Table 3-18. Employment in Tourism-Related Industries in 1990, Gulf of Mexico Coastal Region**

| <b>Labor Market Area</b> | <b>Non-Tourism Employment</b> | <b>Tourism Related Employment</b> | <b>Percent Employment From Tourism</b> |
|--------------------------|-------------------------------|-----------------------------------|----------------------------------------|
| Biloxi, MS               | 151,649                       | 24,197                            | 14                                     |
| New Orleans, LA          | 504,747                       | 113,611                           | 18                                     |
| Houma, LA                | 87,287                        | 19,375                            | 18                                     |
| Baton Rouge, LA          | 276,377                       | 51,698                            | 16                                     |
| Lake Charles, LA         | 113,760                       | 19,812                            | 15                                     |
| Lafayette, LA            | 178,456                       | 26,944                            | 13                                     |
| Tampa, FL                | 797,114                       | 165,051                           | 17                                     |
| Sarasota, FL             | 213,886                       | 46,252                            | 18                                     |
| Miami, FL                | 1,346,820                     | 331,191                           | 20                                     |
| Fort Myers, FL           | 183,110                       | 39,816                            | 18                                     |
| Lake City, FL            | 42,622                        | 6,946                             | 14                                     |
| Ocala, FL                | 93,859                        | 16,845                            | 15                                     |
| Gainesville, FL          | 101,255                       | 19,930                            | 16                                     |
| Tallahassee, FL          | 149,061                       | 27,736                            | 16                                     |
| Panama City, FL          | 51,453                        | 13,123                            | 20                                     |
| Pensacola, FL            | 182,999                       | 34,460                            | 16                                     |
| Mobile, AL               | 240,460                       | 32,127                            | 12                                     |
| Victoria, TX             | 85,008                        | 9,449                             | 10                                     |
| Brownsville, TX          | 218,768                       | 39,714                            | 15                                     |
| Corpus Christi, TX       | 183,047                       | 32,234                            | 15                                     |
| Brazoria, TX             | 112,192                       | 15,725                            | 12                                     |
| Houston, TX              | 1,601,032                     | 267,930                           | 14                                     |
| Beaumont, TX             | 165,918                       | 26,334                            | 14                                     |

**Table 3-19. Marine Mammals of the Alaska Region**

| Species                                                   | Status <sup>a</sup> | Typical Occurrence <sup>b</sup> |           |
|-----------------------------------------------------------|---------------------|---------------------------------|-----------|
|                                                           |                     | Arctic                          | Subarctic |
| <b>ORDER CETACEA</b>                                      |                     |                                 |           |
| <b>Suborder Mysticeti (baleen whales)</b>                 |                     |                                 |           |
| Family Balaenidae                                         |                     |                                 |           |
| <i>Eubalaena glacialis</i> (northern right whale)         | E                   | --                              | X         |
| Family Balaenopteridae                                    |                     |                                 |           |
| <i>Balaenoptera acutorostrata</i> (minke whale)           | --                  | X                               | X         |
| <i>Balaenoptera borealis</i> (sei whale)                  | E                   | --                              | X         |
| <i>Balaenoptera musculus</i> (blue whale)                 | E                   | --                              | X         |
| <i>Balaenoptera mysticetus</i> (bowhead whale)            | E                   | X                               | --        |
| <i>Balaenoptera physalus</i> (fin whale)                  | E                   | X                               | X         |
| <i>Eschrichtius robustus</i> (gray whale)                 | --                  | X                               | X         |
| <i>Megaptera novaeangliae</i> (humpback whale)            | E                   | X                               | X         |
| <b>Suborder Odontoceti (toothed whales and dolphins)</b>  |                     |                                 |           |
| Family Physeteridae                                       |                     |                                 |           |
| <i>Physeter macrocephalus</i> (sperm whale)               | E                   | --                              | X         |
| Family Delphinidae                                        |                     |                                 |           |
| <i>Delphinapterus leucas</i> (beluga whale)               | D                   | X                               | X         |
| <i>Orcinus orca</i> (killer whale)                        | --                  | X                               | X         |
| Family Phocoenidae                                        |                     |                                 |           |
| <i>Phocoenoides dalli</i> (Dall's porpoise)               | --                  | --                              | X         |
| <i>Phocoena phocoena</i> (harbor porpoise)                | --                  | X                               | X         |
| <b>ORDER CARNIVORA</b>                                    |                     |                                 |           |
| <b>Suborder Pinnipedia (seals, sea lions, and walrus)</b> |                     |                                 |           |
| Family Otariidae                                          |                     |                                 |           |
| <i>Callorhinus ursinus</i> (northern fur seal)            | S                   | --                              | X         |
| <i>Eumetopias jubatus</i> (Steller sea lion)              | E                   | --                              | X         |
| Family Phocidae                                           |                     |                                 |           |
| <i>Erignathus barbatus</i> (bearded seal)                 | --                  | X                               | --        |
| <i>Odobenus rosmarus divergens</i> (Pacific walrus)       | --                  | X                               | --        |
| <i>Phoca fasciata</i> (ribbon seal)                       | --                  | X                               | --        |
| <i>Phoca hispida</i> (ringed seal)                        | --                  | X                               | --        |
| <i>Phoca largha</i> (spotted seal)                        | --                  | X                               | --        |
| <i>Phoca vitulina richardsi</i> (harbor seal)             | --                  | --                              | X         |
| <b>Suborder Fissipedia (sea otters and polar bears)</b>   |                     |                                 |           |
| Family Mustelidae                                         |                     |                                 |           |
| <i>Enhydra lutris</i> (sea otter)                         | E                   | --                              | X         |
| Family Ursidae                                            |                     |                                 |           |
| <i>Ursus martimus</i> (polar bear)                        | --                  | X                               | --        |

<sup>a</sup> Status: E = endangered under the Endangered Species Act of 1973; D = depleted stock (applies to Cook Inlet stock of belugas); S = strategic stock.

<sup>b</sup> Occurrence in and near OCS planning areas. Arctic refers to Beaufort Sea, Chukchi Sea, and Hope Basin Planning Areas; Subarctic refers to Gulf of Alaska and Cook Inlet Planning Areas.

**Table 3-20. Terrestrial Mammals That Could Occur Adjacent to Alaska Planning Areas**

| <b>Common Name</b>       | <b>Scientific Name</b>               | <b>Profiled in Text</b> |
|--------------------------|--------------------------------------|-------------------------|
| barren-ground shrew      | <i>Sorex ugyanak</i>                 | --                      |
| tundra shrew             | <i>Sorex tundrensis</i>              | --                      |
| dusky shrew              | <i>Sorex monticolus</i>              | --                      |
| arctic ground squirrel   | <i>Spermophilus parryii</i>          | --                      |
| brown lemming            | <i>Lemmus trimucronatus</i>          | --                      |
| collared lemming         | <i>Dicrostonyx groenlandicus</i>     | --                      |
| northern red-backed vole | <i>Clethrionomys rutilus</i>         | --                      |
| tundra vole              | <i>Microtus oeconomus</i>            | --                      |
| singing vole             | <i>Microtus miurus</i>               | --                      |
| tundra hare              | <i>Lepus othus</i>                   | --                      |
| least weasel             | <i>Mustela nivalus</i>               | --                      |
| short-tailed weasel      | <i>Mustela erminea</i>               | --                      |
| river otter              | <i>Lutra canadensis</i>              | X                       |
| red fox                  | <i>Vulpes vulpes</i>                 | --                      |
| arctic fox               | <i>Alopex lagopus</i>                | X                       |
| wolverine                | <i>Gulo gulo</i>                     | --                      |
| coyote                   | <i>Canis latrans</i>                 | --                      |
| gray wolf                | <i>Canis lupus</i>                   | --                      |
| black bear               | <i>Ursus americanus</i>              | X                       |
| grizzly bear             | <i>Ursus arctos</i>                  | X                       |
| moose                    | <i>Alces alces</i>                   | --                      |
| barren-ground caribou    | <i>Rangifer tarandus</i>             | X                       |
| muskox                   | <i>Ovibos moschatus</i>              | X                       |
| Sitka black-tailed deer  | <i>Odocoileus hemionus sitkensis</i> | X                       |

**Table 3-21. Water Bird Species Occurring in the Alaska Planning Areas. (Some Rare and Accidental Species Are Not Included.)**

| Common Name                 | Scientific Name                  | ESA Status <sup>a</sup> | Occurrence <sup>b</sup> |            |
|-----------------------------|----------------------------------|-------------------------|-------------------------|------------|
|                             |                                  |                         | Arctic                  | Subarctic  |
| common loon                 | <i>Gavia immer</i>               | --                      | Acc                     | U/B,W; C/M |
| Pacific loon                | <i>Gavia pacifica</i>            | --                      | C/B                     | U/B; C/M,W |
| red-throated loon           | <i>Gavia stellata</i>            | --                      | C/B                     | C/B,M; U,W |
| yellow-billed loon          | <i>Gavia adamsii</i>             | --                      | U/B                     | U/M; U/W   |
| red-necked grebe            | <i>Podiceps grisegena</i>        | --                      | C/B                     | U/W        |
| horned grebe                | <i>Podiceps auritus</i>          | --                      | C/B                     | U/W        |
| tundra swan                 | <i>Cygnus columbianus</i>        | --                      | U/B                     | C/M        |
| trumpeter swan              | <i>Cygnus buccinator</i>         | --                      | R/B                     | C/B,M      |
| greater white-fronted goose | <i>Anser albifrons</i>           | --                      | C/B,M                   | C/B,M      |
| snow goose                  | <i>Chen caerulescens</i>         | --                      | U/B,C/M                 | C/M        |
| emperor goose               | <i>Chen canagica</i>             | --                      | R                       | U/M,W      |
| brant                       | <i>Branta bernicla</i>           | --                      | C/B,M                   | U/M        |
| Canada goose                | <i>Branta canadensis</i>         | <sup>c</sup>            | C/B                     | C/B,M      |
| green-winged teal           | <i>Anas crecca</i>               | --                      | U/B                     | C/B,M      |
| mallard                     | <i>Anas platyrhynchos</i>        | --                      | R/B                     | C/B,M      |
| northern pintail            | <i>Anas acuta</i>                | --                      | C/B,M                   | C/B,M      |
| northern shoveler           | <i>Anas spatula</i>              | --                      | R/B                     | C/B,M      |
| gadwall                     | <i>Anas strepera</i>             | --                      | Acc                     | U/B        |
| American wigeon             | <i>Anas americana</i>            | --                      | U/B                     | C/B,M      |
| canvasback                  | <i>Aythya valisineria</i>        | --                      | Acc                     | U/B,M      |
| ring-necked duck            | <i>Aythya collaris</i>           | --                      | Acc                     | R/B,M      |
| greater scaup               | <i>Aythya marila</i>             | --                      | U/B                     | C/B,M      |
| lesser scaup                | <i>Aythya affinis</i>            | --                      | Acc                     | R/B,M,W    |
| common eider                | <i>Somateria mollissima</i>      | --                      | C/B,M                   | U/B,M,W    |
| king eider                  | <i>Somateria spectabilis</i>     | --                      | C/B,M                   | U/M,W      |
| spectacled eider            | <i>Somateria fischeri</i>        | T                       | U/B,M                   | Acc        |
| Steller's eider             | <i>Polysticta stelleri</i>       | T                       | U/B,M                   | U-C/W      |
| harlequin duck              | <i>Histrionicus histrionicus</i> | --                      | R/B                     | C/B,M      |
| long-tailed duck            | <i>Clangula hyemalis</i>         | --                      | C/B,M                   | C/M,W      |
| black scoter                | <i>Melanitta nigra</i>           | --                      | Acc                     | C/M,W      |
| surf scoter                 | <i>Melanitta perspicillata</i>   | --                      | U/B                     | C/M,W      |
| white-winged scoter         | <i>Melanitta fusca</i>           | --                      | U/B                     | C/B,M,W    |
| common goldeneye            | <i>Bucephala clangula</i>        | --                      | Acc                     | R/B; C/M,W |
| Barrow's goldeneye          | <i>Bucephala islandica</i>       | --                      | --                      | C/B,M,W    |
| bufflehead                  | <i>Bucephala albeola</i>         | --                      | Acc                     | R/B; C/M,W |
| hooded merganser            | <i>Lophodytes cucullatus</i>     | --                      | --                      | R/B,M,W    |
| common merganser            | <i>Mergus merganser</i>          | --                      | --                      | C/B,M,W    |
| red-breasted merganser      | <i>Mergus serrator</i>           | --                      | R/B,M                   | C/B,M,W    |

<sup>a</sup> Federal status under the Endangered Species Act of 1973. Abbreviations: T = threatened.

<sup>b</sup> Occurrence information from Johnson and Herter (1989), Armstrong (1990), Isleib and Kessel (1973), U.S. Department of the Interior, Fish and Wildlife Service (1999a), and DeGange and Sanger (1986). Abbreviations: C = common, U = uncommon, R = rare, Acc = accidental, B = breeding bird, M = migration, and W = winter.

<sup>c</sup> The formerly threatened subspecies, the Aleutian Canada goose (*Branta canadensis leucopareia*) was removed from the list of threatened and endangered wildlife by the U.S. Fish and Wildlife Service on March 20, 2001.

**Table 3-22. Shorebird Species Occurring in the Alaska Planning Areas. (Some Rare and Accidental Species Are Not Included.)**

| Common Name             | Scientific Name                | ESA Status <sup>a</sup> | Occurrence <sup>b</sup> |            |
|-------------------------|--------------------------------|-------------------------|-------------------------|------------|
|                         |                                |                         | Arctic                  | Subarctic  |
| black-bellied plover    | <i>Pluvialis squatarola</i>    | --                      | U/B                     | C/M        |
| lesser golden-plover    | <i>Pluvialis dominica</i>      | --                      | C/B                     | C/M        |
| semipalmated plover     | <i>Charadrius semipalmatus</i> | --                      | U/B                     | C/B,M      |
| black oystercatcher     | <i>Haematopus bachmani</i>     | --                      | --                      | C/B,M,W    |
| greater yellowlegs      | <i>Tringa melanoleuca</i>      | --                      | Acc                     | C/B,M      |
| lesser yellowlegs       | <i>Tringa flavipes</i>         | --                      | Acc                     | C/B,M      |
| solitary sandpiper      | <i>Tringa solitaria</i>        | --                      | Acc                     | R/B; U/M   |
| wandering tattler       | <i>Heteroscelus incanus</i>    | --                      | --                      | U/B; C/M   |
| spotted sandpiper       | <i>Actitis macularia</i>       | --                      | --                      | C/B,M      |
| whimbrel                | <i>Numenius phaeopus</i>       | --                      | U                       | C/M        |
| Hudsonian godwit        | <i>Limosa haemastica</i>       | --                      | R                       | U/B,M      |
| bar-tailed godwit       | <i>Limosa lapponica</i>        | --                      | U/B                     | U/B,M      |
| ruddy turnstone         | <i>Arenaria interpres</i>      | --                      | C/B                     | C/M        |
| black turnstone         | <i>Arenaria melanocephala</i>  | --                      | Acc                     | C/M; U/W   |
| surfbird                | <i>Aphriza virgata</i>         | --                      | --                      | U/B; C/M   |
| red knot                | <i>Calidris canutus</i>        | --                      | R/B                     | C/M        |
| sanderling              | <i>Calidris alba</i>           | --                      | R/B                     | U/M; R/W   |
| semipalmated sandpiper  | <i>Calidris pusilla</i>        | --                      | C/B                     | U/M        |
| western sandpiper       | <i>Calidris mauri</i>          | --                      | U/B                     | C/M        |
| least sandpiper         | <i>Calidris minutilla</i>      | --                      | U/B                     | C/B,M      |
| white-rumped sandpiper  | <i>Calidris fuscicollis</i>    | --                      | R/B                     | Acc        |
| baird's sandpiper       | <i>Calidris bairdii</i>        | --                      | C/B                     | U/M        |
| pectoral sandpiper      | <i>Calidris melanotos</i>      | --                      | C/B                     | C/M        |
| rock sandpiper          | <i>Calidris ptilocnemis</i>    | --                      | --                      | C/M,W      |
| dunlin                  | <i>Calidris alpina</i>         | --                      | C/B                     | C/M,W      |
| stilt sandpiper         | <i>Calidris himantopus</i>     | --                      | U/B                     | R/M        |
| buff-breasted sandpiper | <i>Tryngites subruficollis</i> | --                      | U/B                     | Acc        |
| short-billed dowitcher  | <i>Limnodromus griseus</i>     | --                      | --                      | C/B,M      |
| long-billed dowitcher   | <i>Limnodromus scolopaceus</i> | --                      | C/B                     | C/M        |
| common snipe            | <i>Gallinago gallinago</i>     | --                      | C/B                     | C/B,M; R/W |
| red-necked phalarope    | <i>Phalaropus lobatus</i>      | --                      | C/B                     | C/B,M      |
| red phalarope           | <i>Phalaropus fulicaria</i>    | --                      | C/B                     | C/M        |

<sup>a</sup> Federal status under the Endangered Species Act of 1973.

<sup>b</sup> Occurrence information from Johnson and Herter (1989), Armstrong (1990), Isleib and Kessel (1973), and DeGange and Sanger (1987). Abbreviations: C = common, U = uncommon, R = rare, Acc = accidental, B = breeding bird, M = migration, and W = winter.

**Table 3-23. Seabird Species Occurring in the Alaska Planning Areas. (Some Rare and Accidental Species Are Not Included.)**

| Common Name              | Scientific Name                   | ESA Status <sup>a</sup> | Occurrence <sup>b</sup> |            |
|--------------------------|-----------------------------------|-------------------------|-------------------------|------------|
|                          |                                   |                         | Arctic                  | Subarctic  |
| short-tailed albatross   | <i>Diomedea albatrus</i>          | E                       |                         | Acc        |
| black-footed albatross   | <i>Diomedea nigripes</i>          | --                      |                         | C/S,M      |
| laysan albatross         | <i>Diomedea immutabilis</i>       | --                      |                         | R/M        |
| northern fulmar          | <i>Fulmarus glacialis</i>         | --                      | R/S                     | C/S,M; R/W |
| sooty shearwater         | <i>Puffinus griseus</i>           | --                      |                         | C/S,M      |
| short-tailed shearwater  | <i>Puffinus tenuirostris</i>      | --                      | R/S                     | U/S,M      |
| fork-tailed storm petrel | <i>Oceanodroma furcata</i>        | --                      |                         | C/M        |
| Leach's storm petrel     | <i>Oceanodroma leucorhoa</i>      | --                      |                         | U/S        |
| double-crested cormorant | <i>Phalacrocorax auritus</i>      | --                      |                         | C/B,M; U/W |
| Brant's cormorant        | <i>Phalacrocorax penicillatus</i> | --                      |                         | R/S        |
| pelagic cormorant        | <i>Phalacrocorax pelagicus</i>    | --                      | R/S                     | C/B,M,W    |
| red-faced cormorant      | <i>Phalacrocorax urile</i>        | --                      |                         | U/B,M,W    |
| pomarine jaeger          | <i>Stercorarius pomarinus</i>     | --                      | U/B; C/M                | C/M; R/S   |
| parasitic jaeger         | <i>Stercorarius parasiticus</i>   | --                      | C/B                     | C/B,M      |
| long-tailed jaeger       | <i>Stercorarius longicaudus</i>   | --                      | C/B                     | R/B,M      |
| Bonaparte's gull         | <i>Larus philadelphia</i>         | --                      | Acc                     | C/B,M      |
| mew gull                 | <i>Larus canus</i>                | --                      | R/S,M                   | C/B,M,W    |
| ring-billed gull         | <i>Larus delawarensis</i>         | --                      |                         | R/S,M,W    |
| herring gull             | <i>Larus argentatus</i>           | --                      | R/S,M                   | C/M; R/S,W |
| Thayer's gull            | <i>Larus thayeri</i>              | --                      | R/M                     | R/S,W,M    |
| glaucous-winged gull     | <i>Larus glaucescens</i>          | --                      | Acc                     | C/B,M,W    |
| glaucous gull            | <i>Larus hyperboreus</i>          | --                      | C/B,M                   | R/S,W,M    |
| black-legged kittiwake   | <i>Rissa tridactyla</i>           | --                      | C/S,                    | C/B,M; U/W |
| Ross's gull              | <i>Rhodostethia rosea</i>         | --                      | C/M                     | Acc        |
| Sabine's gull            | <i>Xema sabini</i>                | --                      | C/B,M                   | U/M; R/S   |
| arctic tern              | <i>Sterna paradisaea</i>          | --                      | C/B                     | C/B,M      |
| Aleutian tern            | <i>Sterna aleutica</i>            | --                      | Acc                     | U/B,M      |
| common murre             | <i>Uria aalge</i>                 | --                      | Acc                     | C/B,M,W    |
| thick-billed murre       | <i>Uria lomvia</i>                | --                      | C/B                     | R/M,W      |
| black guillemot          | <i>Cephus grylle</i>              | --                      | U/B                     |            |
| pigeon guillemot         | <i>Cephus columba</i>             | --                      |                         | C/B,M,W    |
| marbled murrelet         | <i>Brachyramphus marmoratus</i>   | --                      |                         | C/M,W      |
| Kittlitz's murrelet      | <i>Brachyramphus brevirostris</i> | --                      | R                       | C/S; U/W   |
| ancient murrelet         | <i>Synthliboramphus antiquus</i>  | --                      |                         | U/S,M,W    |
| Cassin's auklet          | <i>Ptychoramphus aleuticus</i>    | --                      |                         | R/S,M      |
| parakeet auklet          | <i>Cyclorhynchus psittacula</i>   | --                      | Acc                     | R/B,M      |
| crested auklet           | <i>Aethia cristatella</i>         | --                      | R/S                     | U/S,W      |
| rhinoceros auklet        | <i>Cerorhinca monocerata</i>      | --                      |                         | R/S,M      |
| tufted puffin            | <i>Fratercula cirrhata</i>        | --                      | Acc                     | C/B,M; R/W |
| horned puffin            | <i>Fratercula corniculata</i>     | --                      | R/S                     | U/B,M; R/W |

<sup>a</sup> Federal status under the Endangered Species Act of 1973. Abbreviations: E = endangered.

<sup>b</sup> Occurrence information from Johnson and Herter (1989), Armstrong (1990), DeGange and Sanger (1987), and Isleib and Kessel (1973). Abbreviations: C = common, U = uncommon, R = rare, Acc = accidental, B = breeding bird, M = migration, W = winter, and S = summer.

**Table 3-24. Species for Which Essential Fish Habitat Has Been Designated in the Gulf of Alaska and Cook Inlet**

| <b>Forage Fish</b> | <b>Groundfish</b> | <b>Flatfish</b>     | <b>Rockfish</b>         | <b>Salmon</b> | <b>Scallops</b> |
|--------------------|-------------------|---------------------|-------------------------|---------------|-----------------|
| rainbow smelt      | skates            | yellowfin sole      | thornyhead              | sockeye       | weathervane     |
| eulochon           | sculpin           | rock sole           | yelloweye               | pink          | pink scallops   |
| capelin            | sablefish         | rex sole            | shortraker and rougheye | coho          | spiny scallops  |
| sand lance         | Pacific cod       | Greenland turbot    | Pacific ocean perch     | chum          |                 |
| myctophids         | atka mackerel     | flathead sole       | northern                | king          |                 |
| bathylagids        | walleye pollock   | Dover sole          | dusky                   |               |                 |
| sand fish          | sharks            | arrowtooth flounder |                         |               |                 |
| euphausiids        | octopus           | Alaska plaice       |                         |               |                 |
| pholids            | red squid         |                     |                         |               |                 |
| stichaeids         |                   |                     |                         |               |                 |
| gonostomatids      |                   |                     |                         |               |                 |

Note: Essential fish habitat for crab species are designated for the Bering Sea Aleutian Islands but not for Gulf of Alaska and Cook Inlet Planning Areas, so they are not included in table.

**Table 3-25. Alaska Comparative Population and Income Measures**

| <b>GEOGRAPHICAL AREA</b>                                    | <b>1970</b> | <b>1980</b> | <b>1990</b> | <b>1998</b> |
|-------------------------------------------------------------|-------------|-------------|-------------|-------------|
| <b>State of Alaska</b>                                      |             |             |             |             |
| median age of population                                    | 22.9        | 26.1        | 29.6        | 32.4        |
| income factors                                              |             |             |             |             |
| number of families                                          | 66,670      | 96,840      | 134,806     |             |
| median income                                               | \$12,507    | \$28,395    | \$46,581    |             |
| mean income                                                 |             |             | \$54,200    |             |
| per capita income                                           |             |             | \$21,191    | \$24,969    |
| poverty factors                                             |             |             |             |             |
| no. families below poverty level                            | 6,199       | NA          | 9,198       |             |
| % persons below poverty level                               | 13%         | 16%         | 9%          |             |
| <b>Beaufort Sea and Northern Chukchi Sea Planning Areas</b> |             |             |             |             |
| North Slope Census Area                                     |             |             |             |             |
| median age of population                                    | 20.6        | 24.7        | 26.6        | 27.0        |
| income factors                                              |             |             |             |             |
| number of families                                          | 433         | 994         | 1,688       |             |
| median income                                               | \$8,575     | \$31,378    | \$50,473    |             |
| mean income                                                 | \$9,408     | \$35,507    | \$58,845    |             |
| per capita income                                           |             |             | \$23,422    | \$23,637    |
| poverty factors                                             |             |             |             |             |
| no. families below poverty level                            | 120         | 81          | 101         |             |
| % persons below poverty level                               | 32%         | 11%         | 9%          |             |
| <b>Southern Chukchi Sea and Hope Basin Planning Areas</b>   |             |             |             |             |
| Kobuk Census Area/NW Arctic Bor.                            |             |             |             |             |
| Median age of population                                    | < 17        | 21.5        | 22.9        | 22.9        |
| Income factors                                              |             |             |             |             |
| Number of families                                          | 694         | 1,149       | 1,543       |             |
| median income                                               | \$6,571     | \$17,756    | \$33,313    |             |
| mean income                                                 | \$8,239     | \$21,069    | \$39,885    |             |
| Per capita income                                           |             |             | \$14,672    | \$18,938    |
| Poverty factors                                             |             |             |             |             |
| No. families below poverty level                            | 224         | 218         | 205         |             |
| % persons below poverty level                               | 35%         | 27%         | 19%         |             |



**Table 3-25. Alaska Comparative Population and Income Measures (continued)**

| <b>GEOGRAPHICAL AREA</b>                     | <b>1970</b> | <b>1980</b> | <b>1990</b> | <b>1998</b> |
|----------------------------------------------|-------------|-------------|-------------|-------------|
| <b>Norton Basin Planning Areas</b>           |             |             |             |             |
| Nome Census Area                             |             |             |             |             |
| median age of population                     | NA          | 23.4        | 26.4        | 26.7        |
| income factors                               |             |             |             |             |
| number of families                           | 1,010       | 1,758       | 2,407       |             |
| median income                                | \$7,340     | \$14,550    | \$30,144    |             |
| mean income                                  | \$9,253     | \$19,728    | \$36,654    |             |
| per capita income                            |             |             | \$13,864    | \$18,008    |
| poverty factors                              |             |             |             |             |
| no. families below poverty level             | 315         | 326         | 337         |             |
| % persons below poverty level                | 35%         | 28%         | 22%         |             |
| <b>Cook Inlet Planning Area</b>              |             |             |             |             |
| Kenai-Cook Inlet Census Area/Kenai Pen. Bor. |             |             |             |             |
| median age of population                     | NA          | 26.3        | 31.3        | 35.4        |
| Income factors                               |             |             |             |             |
| Number of families                           | 3,344       | 8,656       | 14,323      |             |
| median income                                | \$12,969    | \$23,660    | \$42,403    |             |
| mean income                                  | \$14,150    | \$27,901    | \$50,816    |             |
| Per capita income                            |             |             | \$21,102    | \$22,979    |
| Poverty factors                              |             |             |             |             |
| No. families below poverty level             | 239         | 568         | 640         |             |
| % persons below poverty level                | 9%          | 12%         | 8%          |             |
| Municipality of Anchorage                    |             |             |             |             |
| median age of population                     | NA          | 26.3        | 30.1        | 32.1        |
| Income factors                               |             |             |             |             |
| Number of families                           | 29,992      | 60,826      | 83,043      |             |
| median income                                | \$13,593    | \$27,375    | \$43,946    |             |
| mean income                                  | \$15,059    | \$32,073    | \$52,809    |             |
| Per capita income                            |             |             | \$24,664    | \$29,343    |
| Poverty factors                              |             |             |             |             |
| No. families below poverty level             | 1499        | 2677        | 3116        |             |
| % persons below poverty level                | 7%          | 7%          | 7%          |             |

Source: U.S. Department of Commerce, Bureau of the Census (1973, 1983, 1992); Alaska Department of Labor (2000b); Williams (2000).

**Table 3-26. State of Alaska Population Projections by Age, 1998-2025**

| Age               | 1998           | 2000           | 2005           | 2006           | 2010           | 2015           | 2020           | 2025           |
|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 0 – 4             | 52,036         | 51,000         | 53,000         | 54,000         | 59,000         | 66,000         | 70,000         | 71,000         |
| 5 – 9             | 57,823         | 56,000         | 54,000         | 54,000         | 56,000         | 62,000         | 69,000         | 73,000         |
| 10 – 14           | 55,756         | 59,000         | 59,000         | 58,000         | 57,000         | 58,000         | 65,000         | 72,000         |
| 15 – 19           | 48,622         | 52,000         | 58,000         | 59,000         | 58,000         | 56,000         | 57,000         | 64,000         |
| 20 – 24           | 34,485         | 38,000         | 47,000         | 48,000         | 52,000         | 52,000         | 50,000         | 52,000         |
| 25 – 29           | 39,401         | 35,000         | 40,000         | 43,000         | 51,000         | 57,000         | 56,000         | 54,000         |
| 30 – 34           | 49,539         | 47,000         | 37,000         | 36,000         | 43,000         | 53,000         | 59,000         | 59,000         |
| 35 – 44           | 120,347        | 117,000        | 103,000        | 98,000         | 84,000         | 79,000         | 95,000         | 111,000        |
| 45 – 54           | 89,752         | 99,000         | 111,000        | 112,000        | 109,000        | 96,000         | 78,000         | 74,000         |
| 55 – 59           | 24,826         | 27,000         | 40,000         | 42,000         | 48,000         | 50,000         | 46,000         | 39,000         |
| 60 – 64           | 16,119         | 18,000         | 25,000         | 26,000         | 36,000         | 43,000         | 45,000         | 41,000         |
| 65+               | 32,694         | 36,000         | 44,000         | 47,000         | 58,000         | 78,000         | 103,000        | 124,000        |
| <b>Total</b>      | <b>621,400</b> | <b>635,000</b> | <b>670,000</b> | <b>679,000</b> | <b>709,000</b> | <b>751,000</b> | <b>793,000</b> | <b>833,000</b> |
| median age        | 32.4           | 32.9           | 33.4           | 33.2           | 32.4           | 32.2           | 32.4           | 32.7           |
| males/100 females | 108.3          | 107.9          | 106.8          | 106.6          | 105.8          | 104.7          | 103.8          | 102.9          |
| youth dependency  | 50.2           | 49.6           | 47.7           | 47.5           | 46.5           | 48.9           | 53.2           | 56.6           |
| aged dependency   | 8.3            | 8.9            | 10.5           | 10.9           | 13.0           | 17.4           | 22.7           | 27.5           |

Source: Alaska Department of Labor (1998).

**Table 3-27. Alaska Population and Employment Composition**

| <b>Population Variable</b>                 | <b>1970</b> | <b>1980</b> | <b>1990</b> | <b>1998</b>      |             |
|--------------------------------------------|-------------|-------------|-------------|------------------|-------------|
| total population                           | 300,382     | 401,851     | 550,043     | 621,400          |             |
| percent change from previous period        |             | 33.8        | 36.9        | 13.0             |             |
| <b>Age Structure (%)</b>                   |             |             |             |                  |             |
| 0 – 5                                      | 10.7        | 9.7         | 9.9         | 8.4              |             |
| 6 – 15                                     | 23.6        | 17.2        | 17.2        | 18.3             |             |
| 16 – 17                                    | 8.9         | 9.2         | 4.1         | 7.8              |             |
| 18 – 24                                    | 11.8        | 11.2        | 2.6         | 5.5              |             |
| 25 – 34                                    | 16.4        | 22.7        | 17.0        | 14.3             |             |
| 35 – 44                                    | 12.7        | 13.4        | 21.5        | 19.4             |             |
| 45 – 54                                    | 9.0         | 8.4         | 14.3        | 14.4             |             |
| 55 – 64                                    | 4.6         | 5.3         | 7.1         | 6.6              |             |
| 65 +                                       | 2.3         | 2.8         | 6.3         | 5.3              |             |
| <b>Race and Ethnic Composition (%)</b>     |             |             |             |                  |             |
| White                                      | 78.8        | 77.6        | 75.5        | 73.9             |             |
| American Native                            | 5.4         | 16.0        | 15.6        | 16.8             |             |
| African American                           | 3.0         | 3.4         | 4.1         | 4.4              |             |
| Asian/Pacific Islander                     | 0.9         | 2.1         | 3.6         | 4.9              |             |
| Other                                      | 11.9        | 0.9         | 1.2         | 0.0              |             |
| <b>Education of Persons Age 25+ (%)</b>    |             |             |             |                  |             |
| number of persons                          | 134,948     | 211,397     | 323,429     |                  |             |
| 0 – 8 years schooling                      | 18.4        | 9.0         | 5.1         |                  |             |
| 9 – 11 years schooling                     | 14.9        | 8.5         | 8.2         |                  |             |
| high school graduates                      | 37.7        | 38.9        | 28.7        |                  |             |
| 13 – 15 years schooling                    | 14.9        | 22.6        | 34.9        |                  |             |
| college graduates or more                  | 14.1        | 21.1        | 23.0        |                  |             |
| <b>Labor Force Size (%)</b>                |             |             |             |                  |             |
| civilian                                   | 76.6        | 89.3        | 91.5        |                  |             |
| military                                   | 23.4        | 10.7        | 8.5         |                  |             |
| total (number)                             | 131,553     | 204,682     | 293,957     |                  |             |
| <b>Employment by Occupation Sector (%)</b> |             |             |             |                  |             |
| management and professional                | 24.6        | 28.6        | 30.0        |                  |             |
| technical, sales, administrative support   | 34.6        | 30.5        | 30.7        |                  |             |
| precision production, craft, repair        | 11.4        | 12.5        | 11.2        |                  |             |
| operatives, fabricators, laborers          | 11.5        | 11.2        | 11.0        |                  |             |
| farming, forestry, fishing                 | 1.6         | 3.7         | 2.7         |                  |             |
| service occupations                        | 16.3        | 13.4        | 14.4        |                  |             |
|                                            |             |             |             | <b>ADOL Data</b> |             |
| <b>Employment by Industry Group (%)</b>    |             |             |             | <b>1990</b>      | <b>1998</b> |
| agriculture, forestry, fishing             | 1.8         | 3.1         | 3.5         | 0.5              | 0.5         |
| mining                                     | 2.5         | 2.9         | 3.6         | 4.9              | 3.8         |
| construction                               | 8.8         | 8.0         | 6.6         | 4.4              | 4.9         |
| manufacturing                              | 7.1         | 6.3         | 5.9         | 7.3              | 5.3         |
| transportation, communications, utilities  | 11.6        | 11.2        | 10.7        | 8.7              | 9.4         |
| wholesale and retail trade                 | 18.8        | 17.6        | 19.2        | 19.5             | 20.8        |
| finance                                    | 3.7         | 5.1         | 4.6         | 3.9              | 4.2         |
| services                                   | 45.7        | 46.0        | 45.8        | 21.1             | 24.7        |
| nonclassifiable (1998 ADOL data only)      | --          | --          | --          | 0.3              | 0.1         |
| total Government (1998 ADOL data only)     | --          | --          | --          | 29.5             | 26.3        |

Source: U.S. Department of Commerce, Bureau of the Census (1973, 1983, 1992); Alaska Department of Labor (ADOL) (2000a,b).

**Table 3-28. Beaufort Sea and Chukchi Sea Planning Areas Population and Employment Composition (North Slope Census Area)**

| <b>Population Variable</b>                          | <b>1970</b> | <b>1980</b> | <b>1990</b> | <b>1998</b> |
|-----------------------------------------------------|-------------|-------------|-------------|-------------|
| total population                                    | 2,663       | 4,199       | 5,979       | 7,403       |
| percent change from previous period                 |             | 57.7        | 42.4        | 23.8        |
| <b>Age Structure (%)</b>                            |             |             |             |             |
| 0 – 5                                               | 11.1        | 9.8         | 13.9        | 9.6         |
| 6 – 15                                              | 28.7        | 17.7        | 19.6        | 25.0        |
| 16 – 17                                             | 8.9         | 12.1        | 4.1         | 8.4         |
| 18 – 24                                             | 10.7        | 11.1        | 2.2         | 4.9         |
| 25 – 34                                             | 13.8        | 20.9        | 17.2        | 13.4        |
| 35 – 44                                             | 11.2        | 11.5        | 17.9        | 16.8        |
| 45 – 54                                             | 5.1         | 8.8         | 12.6        | 11.9        |
| 55 – 64                                             | 5.9         | 4.5         | 7.2         | 5.9         |
| 65 +                                                | 4.6         | 3.6         | 5.3         | 4.0         |
| <b>Race and Ethnic Composition (%)</b>              |             |             |             |             |
| White                                               | 12.4        | 21.8        | 21.3        | 30.7        |
| American Native                                     | 0.4         | 76.8        | 72.5        | 56.2        |
| African American                                    | 0.5         | 0.3         | 0.7         | 1.7         |
| Asian/Pacific Islander                              | 0.1         | 0.8         | 4.8         | 11.4        |
| Other                                               | 86.6        | 0.2         | 0.7         | 0.0         |
| <b>Education of Persons Age 25+ (%)</b>             |             |             |             |             |
| number of persons                                   | 1033        | 960         | 3183        | --          |
| 0 – 8 years schooling                               | 72.5        | 9.2         | 19.0        | --          |
| 9 – 11 years schooling                              | 8.4         | 12.9        | 12.5        | --          |
| high school graduates                               | 9.0         | 39.1        | 30.5        | --          |
| 13 – 15 years schooling                             | 3.6         | 19.1        | 23.9        | --          |
| college graduates or more                           | 6.5         | 19.8        | 14.1        | --          |
| <b>Labor Force Size (%)</b>                         |             |             |             |             |
| civilian                                            | 84.9        | 92.3        | 99.7        | --          |
| military                                            | 15.1        | 7.7         | 0.3         | --          |
| total (number)                                      | 713         | 2,031       | 2,964       | --          |
| <b>Employment by Occupation Sector (%)</b>          |             |             |             |             |
| management and professional                         | 21.3        | 21.3        | 27.0        | --          |
| technical, sales, administrative support            | 15.5        | 20.6        | 26.4        | --          |
| precision production, craft, repair                 | 18.5        | 22.7        | 15.7        | --          |
| operatives, fabricators, laborers                   | 26.4        | 14.9        | 13.6        | --          |
| farming, forestry, fishing                          | 0.0         | 0.7         | 0.2         | --          |
| service occupations                                 | 18.2        | 19.8        | 17.2        | --          |
| <b>Employment by Industry Group (%)<sup>1</sup></b> |             |             |             |             |
| agriculture, forestry, fishing                      | 0.0         | 1.0         | 0.6         | 0.0         |
| mining                                              | 10.1        | 5.1         | 4.9         | 45.4        |
| construction                                        | 3.4         | 22.4        | 13.9        | 4.4         |
| manufacturing                                       | 0.7         | 1.4         | 1.3         | 0.1         |
| transportation, communications, utilities           | 12.2        | 11.7        | 12.1        | 5.1         |
| wholesale and retail trade                          | 12.0        | 7.8         | 8.1         | 6.5         |
| finance                                             | 1.3         | 3.6         | 1.9         | 2.1         |
| services                                            | 60.3        | 47.1        | 57.1        | 12.2        |
| nonclassifiable (1998 ADOL data only)               | --          | --          | --          | 0.0         |
| total government (1998 ADOL data only)              | --          | --          | --          | 24.3        |

Source: U.S. Department of Commerce, Bureau of the Census (1973, 1983, 1992).

<sup>1</sup> 1998 data: Alaska Department of Labor (ADOL) (2000a,b).

**Table 3-29. Hope Basin Planning Area Population and Employment Composition (Kobuk Census Area)**

| <b>Population Variable</b>                          | <b>1970</b> | <b>1980</b> | <b>1990</b> | <b>1998</b> |
|-----------------------------------------------------|-------------|-------------|-------------|-------------|
| total population                                    | 10,217      | 11,368      | 14,401      | 16,246      |
| percent change from previous period                 |             | 11.3        | 26.7        | 12.8        |
| <b>Age Structure (%)</b>                            |             |             |             |             |
| 0 – 5                                               | 12.7        | 11.5        | 14.1        | 11.2        |
| 6 – 15                                              | 30.6        | 21.4        | 21.4        | 24.6        |
| 16 – 17                                             | 10.7        | 11.7        | 4.7         | 8.5         |
| 18 – 24                                             | 7.3         | 10.3        | 2.8         | 5.5         |
| 25 – 34                                             | 12.4        | 17.4        | 15.9        | 12.9        |
| 35 – 44                                             | 9.4         | 9.7         | 16.6        | 15.6        |
| 45 – 54                                             | 7.9         | 8.1         | 10.0        | 10.6        |
| 55 – 64                                             | 5.2         | 5.1         | 7.0         | 5.4         |
| 65 +                                                | 3.9         | 5.0         | 7.3         | 5.6         |
| <b>Race and Ethnic Composition (%)</b>              |             |             |             |             |
| White                                               | 17.1        | 17.6        | 19.9        | 15.3        |
| American Native                                     | 0.3         | 81.9        | 78.9        | 83.5        |
| African American                                    | 0.3         | 0.2         | 0.1         | 0.4         |
| Asian/Pacific Islander                              | 0.2         | 0.2         | 0.7         | 0.9         |
| Other                                               | 82.2        | 0.1         | 0.4         | 0.0         |
| <b>Education of Persons Age 25+ (%)</b>             |             |             |             |             |
| number of persons                                   | 3,940       | 8,182       | 7,195       | --          |
| 0 – 8 years schooling                               | 63.8        | 20.7        | 23.2        | --          |
| 9 – 11 years schooling                              | 8.4         | 10.2        | 12.3        | --          |
| high school graduates                               | 13.1        | 34.9        | 32.6        | --          |
| 13 – 15 years schooling                             | 6.7         | 19.0        | 18.9        | --          |
| college graduates or more                           | 8.2         | 16.5        | 13.1        | --          |
| <b>Labor Force Size (%)</b>                         |             |             |             |             |
| civilian                                            | 89.6        | 97.7        | 98.5        | --          |
| military                                            | 10.4        | 2.3         | 1.5         | --          |
| total (number)                                      | 2,453       | 3,844       | 5,422       | --          |
| <b>Employment by Occupation Sector (%)</b>          |             |             |             |             |
| management and professional                         | 38.1        | 34.2        | 32.5        | --          |
| technical, sales, administrative support            | 16.5        | 27.1        | 29.4        | --          |
| precision production, craft, repair                 | 11.2        | 10.0        | 9.6         | --          |
| operatives, fabricators, laborers                   | 14.6        | 7.9         | 0.0         | --          |
| farming, forestry, fishing                          | 0.7         | 0.7         | 0.8         | --          |
| service occupations                                 | 18.9        | 20.1        | 18.7        | --          |
| <b>Employment by Industry Group (%)<sup>1</sup></b> |             |             |             |             |
| agriculture, forestry, fishing                      | 1.5         | 0.6         | 0.9         | 0.1         |
| mining                                              | 2.9         | 2.0         | 4.6         | 7.2         |
| construction                                        | 3.9         | 4.5         | 3.4         | 2.3         |
| manufacturing                                       | 2.2         | 1.6         | 1.2         | 0.4         |
| transportation, communications, utilities           | 13.7        | 11.4        | 12.1        | 9.3         |
| wholesale and retail trade                          | 14.3        | 11.9        | 15.6        | 10.6        |
| finance                                             | 0.4         | 2.5         | 1.9         | 6.2         |
| services                                            | 61.1        | 65.4        | 60.3        | 27.0        |
| nonclassifiable (1998 ADOL data only)               | --          | --          | --          | 0.0         |
| total government (1998 ADOL data only)              | --          | --          | --          | 37.0        |

Source: U.S. Department of Commerce, Bureau of the Census (1973, 1983, 1992).

<sup>1</sup> 1998 data: Alaska Department of Labor (ADOL) (2000a,b).

**Table 3-30. Cook Inlet Planning Area Population and Employment Composition (Kenai-Cook Inlet Census Area, Kenai Peninsula Borough, Municipality of Anchorage, and Matanuska-Susitna Borough)**

| <b>Population Variable</b>                          | <b>1970</b> | <b>1980</b> | <b>1990</b> | <b>1998</b> |
|-----------------------------------------------------|-------------|-------------|-------------|-------------|
| total population                                    | 138,792     | 199,713     | 267,140     | 307,597     |
| percent change from previous period                 |             | 43.9        | 33.8        | 15.1        |
| <b>Age Structure (%)</b>                            |             |             |             |             |
| 0 – 5                                               | 10.6        | 9.4         | 9.4         | 8.3         |
| 6 – 15                                              | 27.5        | 16.9        | 16.3        | 17.4        |
| 16 – 17                                             | 8.5         | 8.9         | 4.2         | 7.5         |
| 18 – 24                                             | 6.8         | 11.3        | 2.6         | 5.7         |
| 25 – 34                                             | 17.2        | 23.3        | 16.9        | 15.0        |
| 35 – 44                                             | 14.9        | 14.1        | 22.0        | 19.6        |
| 45 – 54                                             | 9.5         | 8.7         | 15.0        | 14.6        |
| 55 – 64                                             | 3.7         | 5.2         | 7.5         | 6.6         |
| 65 +                                                | 1.4         | 2.1         | 6.1         | 5.2         |
| <b>Race and Ethnic Composition (%)</b>              |             |             |             |             |
| White                                               | 90.8        | 86.6        | 82.3        | 79.9        |
| American Native                                     | 1.6         | 5.4         | 6.5         | 7.9         |
| African American                                    | 3.8         | 4.7         | 5.5         | 6.2         |
| Asian/Pacific Islander                              | 0.8         | 2.2         | 4.2         | 6.1         |
| Other                                               | 3.0         | 1.0         | 1.4         | 0.0         |
| <b>Education of Persons Age 25+ (%)</b>             |             |             |             |             |
| number of persons                                   | 6351        | 106,714     | 161,078     | --          |
| 0 – 8 years schooling                               | 10.3        | 4.6         | 3.0         | --          |
| 9 – 11 years schooling                              | 14.9        | 7.8         | 7.1         | --          |
| high school graduates                               | 42.4        | 40.2        | 26.7        | --          |
| 13 – 15 years schooling                             | 17.1        | 24.7        | 37.7        | --          |
| college graduates or more                           | 15.3        | 22.7        | 25.5        | --          |
| <b>Labor Force Size (%)</b>                         |             |             |             |             |
| civilian                                            | 78.6        | 89.7        | 92.8        | --          |
| military                                            | 21.4        | 10.3        | 7.2         | --          |
| total (number)                                      | 625,98      | 106,888     | 149,507     | --          |
| <b>Employment by Occupation Sector (%)</b>          |             |             |             |             |
| management and professional                         | 31.2        | 79.3        | 31.2        | --          |
| technical, sales, administrative support            | 27.3        | 10.1        | 33.7        | --          |
| precision production, craft, repair                 | 15.4        | 3.5         | 10.5        | --          |
| operatives, fabricators, laborers                   | 12.8        | 3.0         | 9.2         | --          |
| farming, forestry, fishing                          | 0.2         | 0.4         | 1.5         | --          |
| service occupations                                 | 13.2        | 3.7         | 13.9        | --          |
| <b>Employment by Industry Group (%)<sup>1</sup></b> |             |             |             |             |
| agriculture, forestry, fishing                      | 0.7         | 1.7         | 0.3         | 0.5         |
| mining                                              | 3.5         | 4.2         | 0.7         | 3.5         |
| construction                                        | 10.4        | 8.0         | 0.8         | 5.4         |
| manufacturing                                       | 4.0         | 3.9         | 0.6         | 2.6         |
| transportation, communications, utilities           | 11.4        | 11.6        | 1.5         | 10.1        |
| wholesale and retail trade                          | 21.2        | 19.6        | 2.8         | 24.0        |
| finance                                             | 5.0         | 7.2         | 74.7        | 4.9         |
| services                                            | 43.6        | 43.7        | 18.6        | 26.7        |
| nonclassifiable (1998 ADOL data only)               | --          | --          | --          | 0.0         |
| total government (1998 ADOL data only)              | --          | --          | --          | 22.2        |

Source: U.S. Department of Commerce, Bureau of the Census (1973, 1983, 1992).

<sup>1</sup> 1998 data: Alaska Department of Labor (ADOL) (2000a,b).

**Table 3-31. Threatened or Endangered Marine Mammals in the Pacific Region**

| Species                                                                         | Status <sup>a</sup> |
|---------------------------------------------------------------------------------|---------------------|
| <b>ORDER CETACEA</b>                                                            |                     |
| <b>Suborder Mysticeti (baleen whales)</b>                                       |                     |
| Family Balaenidae                                                               |                     |
| <i>Balaena (Eubalaena) glacialis</i> (includes <i>australis</i> ) (right whale) | E                   |
| Family Balaenopteridae                                                          |                     |
| <i>Balaenoptera borealis</i> (sei whale)                                        | E                   |
| <i>Balaenoptera musculus</i> (blue whale)                                       | E                   |
| <i>Balaenoptera physalus</i> (fin whale)                                        | E                   |
| <i>Megaptera novaeangliae</i> (humpback whale)                                  | E                   |
| <b>Suborder Odontoceti (toothed whales and dolphins)</b>                        |                     |
| Family Physeteridae                                                             |                     |
| <i>Physeter macrocephalus</i> (sperm whale)                                     | E                   |
| <b>ORDER CARNIVORA</b>                                                          |                     |
| Family Otariidae                                                                |                     |
| <i>Arctocephalus townsendi</i> (Guadalupe fur seal)                             | T                   |
| <i>Eumetopias jubatus</i> (Steller [=northern] sea lion)                        | T <sup>b</sup>      |
| Family Mustelidae                                                               |                     |
| <i>Enhydra lutris nereis</i> (southern sea otter)                               | T <sup>c</sup>      |

Sources: State of California, The Resources Agency, Department of Fish and Game (2000); U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (2001a).

- <sup>a</sup> Status: E = endangered, T = threatened under the Endangered Species Act of 1973. Individual Pacific states (e.g., California, Washington) may also designate individual marine mammal species as endangered, threatened, rare, or candidate species under state law.
- <sup>b</sup> The Steller sea lions inhabiting the Pacific OCS Region belong to the eastern population, which is still listed as threatened. The western population, all of which is in Alaska, was reclassified as endangered in 1997.
- <sup>c</sup> Only the southern California population of the sea otter is threatened. A population established in Washington using translocated Alaskan sea otters is not federally listed.

**Table 3-32. Marine Resources of Concern in California**

| <b>Northern California</b>                 | <b>Central California</b>                                                    | <b>Southern California</b>                           |
|--------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------|
| Redwood National Park ASBS                 | Central California Biosphere Reserve                                         | Channel Islands Biosphere Reserve*                   |
| Redwood National Park                      | Gulf of the Farallones NMS*                                                  | Channel Islands NMS*                                 |
| Kelp Beds at Trinidad Head ASBS            | Pt. Reyes National Seashore                                                  | Channel Islands National Park*                       |
| Kings Range MRPA Ecological Reserve        | Bird Rock ASBS*                                                              | Santa Barbara Channel Ecological Preserve*           |
| King Range National Conservation Area ASBS | Pt. Reyes Headlands Reserve and Extension Area ASBS*                         | San Miguel Island Ecological Reserve*                |
| MacKerricher State Park                    | Pt. Reyes Headlands Reserve*                                                 | Santa Barbara Island Ecological Reserve*             |
| Pygmy ASBS                                 | Pt. Reyes Headlands National Research Natural Area*                          | Anacapa Island Ecological Reserve*                   |
| Pt. Cabrillo Reserve                       | Double Point ASBS*                                                           | San Miguel, Santa Rosa, and Santa Cruz Islands ASBS* |
| Russian Gulch State Park                   | Duxbury Reef ASBS*                                                           | Santa Barbara and Anacapa Islands ASBS*              |
| Van Damme State Park                       | Duxbury Reef Reserve*                                                        | San Nicolas and Begg Rock ASBS*                      |
| Manchester State Park                      | Farallon Island ASBS*                                                        | Big Sycamore Canyon MRPA Ecological Reserve          |
| Arena Rock Natural Preserve                | Farallon Islands Game Refuge*                                                | Mugu Lagoon to Latigo Point ASBS                     |
| Kelp Beds at Saunders Reef ASBS            | Monterey Bay NMS                                                             | Abalone Cove Ecological Reserve                      |
| Del Mar Landing Ecological Reserve ASBS    | Golden Gate National Recreation Area                                         | Point Fermin Marine Life Refuge*                     |
| Del Mar Landing Ecological Reserve         | James V. Fitzgerald Marine Reserve ASBS                                      | Santa Catalina Island-Subarea One                    |
| Salt Point State Park                      | James V. Fitzgerald Marine Reserve                                           | Catalina Science Marine Life Refuge                  |
| Gerstle Cove ASBS                          | Ano Nuevo Point and Island ASBS                                              | Santa Catalina Island-Subarea Two                    |
| Gerstle Cove Reserve                       | Pacific Grove Marine Gardens Fish Refuge and Hopkins Marine Life Refuge ASBS | Santa Catalina Island-Subarea Three                  |
| Fort Ross State Historic Park              | Hopkins Marine Life Refuge                                                   | Farnsworth Bank Ecological Reserve                   |
| Sonoma Coast State Beach                   | Pacific Grove Marine Gardens Fish Refuge                                     | Lovers Cove Reserve                                  |
| Bodega Marine Life Refuge ASBS             | Carmel Bay Ecological Reserve ASBS                                           | Santa Catalina Island-Subarea Four                   |
| Bodega Marine Life Refuge                  | Carmel Bay Ecological Reserve                                                | San Clemente Island ASBS                             |
| Cordell Banks NMS                          | California Sea Otter Game Refuge                                             | Newport Marine Life Refuge                           |



**Table 3-32. Marine Resources of Concern in California (Continued)**

| <b>Northern California</b> | <b>Central California</b>                             | <b>Southern California</b>                 |
|----------------------------|-------------------------------------------------------|--------------------------------------------|
|                            | Point Lobos Ecological Reserve ASBS                   | Newport Marine Life Refuge ASBS            |
|                            | Point Lobos Ecological Reserve                        | Crystal Cove State Park                    |
|                            | Point Lobos Reserve                                   | Irvine Coast Marine Life Refuge            |
|                            | Julia Pfeiffer Burns Underwater Park ASBS             | Irvine Coast Marine Life Refuge ASBS       |
|                            | Julia Pfeiffer Burns State Park                       | Laguna Beach Marine Life Refuge            |
|                            | Big Creek MRPA Ecological Reserve                     | Heisler Park Ecological Reserve            |
|                            | Ocean Area Surrounding the Mouth of Salmon Creek ASBS | Heisler Park Ecological Reserve ASBS       |
|                            | Atascadero Beach Pismo Clam Preserve (Clam Refuge)    | South Laguna Beach Marine Life Refuge      |
|                            | Morro Beach Pismo Clam Preserve (Clam Refuge)         | Niguel Marine Life Refuge                  |
|                            | Pismo Invertebrate Reserve                            | Dana Point Marine Life Refuge              |
|                            | Pismo-Oceano Beach Pismo Clam Preserve (Clam Refuge)  | Doheny State Beach                         |
|                            | Vandenberg MRPA Ecological Reserve                    | Doheny Marine Life Refuge                  |
|                            |                                                       | City of Encinitas Marine Life Refuge       |
|                            |                                                       | Cardiff and Elijo State Beaches            |
|                            |                                                       | San Diego-La Jolla City Underwater Park    |
|                            |                                                       | San Diego Marine Life Refuge               |
|                            |                                                       | Scripps Coastal Reserve                    |
|                            |                                                       | San Diego Marine Life Refuge ASBS          |
|                            |                                                       | San Diego-La Jolla Ecological Reserve      |
|                            |                                                       | San Diego-La Jolla Ecological Reserve ASBS |
|                            |                                                       | Cabrillo National Monument                 |
|                            |                                                       | Point Loma Reserve                         |

Abbreviations: ASBS = area of special biological significance; MRPA = Marine Resources Protection Act; and NMS = national marine sanctuary.

Note (1): Resources denoted by an asterisk (\*) may be at greater risk of oil-spill impact due to their location relative to port operations at Los Angeles and San Francisco, or vessel traffic lanes approaching these ports.

Note (2): In addition to federally or State-designated parks and/or monuments, the State of California has established a broad category for unique, sensitive, or valuable marine resource areas, including ASBS's, ecological reserves, marine life refuges, and reserves and preserves. Combined, these marine resources have been designated as California Marine Protected Areas (CMPA's). While there may be some overlap in the future, CMPA's should be considered distinct from (yet to be federally-designated) marine protected areas (MPA's). The mechanism for establishing MPA's was implemented by President Clinton under Executive Order 13198 in May 2000.

**Table 4-1a. The Proposed Action (Alternative 1) – Exploration and Development Scenario for the Gulf of Mexico Region**

| Scenario Elements                      | Gulf of Mexico Region |               |                  |
|----------------------------------------|-----------------------|---------------|------------------|
|                                        | Western               | Central       | Eastern          |
| Sales                                  | 5                     | 5             | 2                |
| Oil Production (BBO)                   | 0.68 – 1.31           | 1.38 – 3.27   | 0.10 – 0.17      |
| Gas Production (Tcf)                   | 4.05 – 7.20           | 7.95 – 16.50  | 0.405 – 0.68     |
| Years of Activity                      | 40                    | 40            | 40               |
| Platforms                              | 50 – 75               | 130 – 240     | 2 – 3            |
| Exploration and Delineation Wells      | 185 – 575             | 555 – 1,235   | 17 – 26          |
| Development and Production Wells       | 490 – 825             | 890 – 1,760   | 30 – 52          |
| Miles of Pipeline                      | 500 – 1,500           | 800 – 2,400   | 200 – 350        |
| Landfalls                              | 0 – 5                 | 0 – 5         | 1 – 2 (gas only) |
| Vessel Trips/Week                      | 60 – 100              | 175 – 350     | 3 – 5            |
| Helicopter Trips/Week                  | 75 – 125              | 225 – 425     | 4 – 6            |
| New Shore Bases                        | 0 – 3                 | 0 – 1         | 0                |
| New Process Facilities                 | 0                     | 0             | 0                |
| New Waste Facilities                   | 2                     | 4             | 0                |
| Drill Muds/Well (bbl)                  |                       |               |                  |
| Exploration/Delineation                | 7,860                 | 7,860         | 7,860            |
| Development/Production                 | 5,800                 | 5,800         | 5,800            |
| Drill Cuttings/Well (bbl)              |                       |               |                  |
| Exploration/Delineation                | 2,680                 | 2,680         | 2,680            |
| Development/Production                 | 1,630                 | 1,630         | 1,630            |
| Produced Water/Well (bbl)              |                       |               |                  |
| Oil Well                               | 450                   | 450           | 450              |
| Gas Well                               | 68                    | 68            | 68               |
| Bottom Area Disturbed – Platforms (ha) | 75 – 115              | 200 – 350     | 4 – 6            |
| Bottom Area Disturbed – Pipeline (ha)  | 700 – 2,000           | 1,100 – 3,300 | 280 – 490        |
| Platform Removals with Explosives      | 40 – 60               | 100 – 190     | 0                |

**Table 4-1b. The Proposed Action (Alternative 1) – Exploration and Development Scenario for the Alaska Region**

| Scenario Elements                      | Alaska Region |             |                               |             |                               |
|----------------------------------------|---------------|-------------|-------------------------------|-------------|-------------------------------|
|                                        | Beaufort Sea  | Chukchi Sea | Hope Basin                    | Cook Inlet  | Norton Basin                  |
| Sales                                  | 3             | 2           | 2                             | 2           | 1                             |
| Oil Production (BBO)                   | 1.02 – 1.71   | 0.96 – 2.42 | 0.010 – 0.020<br>(condensate) | 0.28 – 0.34 | 0.005 – 0.008<br>(condensate) |
| Gas Production (Tcf)                   | None          | None        | 0.290 – 0.714                 | 0.38 – 0.58 | 0.260 – 0.400                 |
| Years of Activity                      | 30            | 35          | 25                            | 35          | 20                            |
| Platforms                              | 6 – 12        | 2 – 8       | 2                             | 2 – 6       | 1                             |
| Exploration and Delineation Wells      | 18 – 30       | 6 – 24      | 6 – 10                        | 8 – 18      | 3 – 5                         |
| Development and Production Wells       | 190 – 325     | 106 – 320   | 8 – 18                        | 84 – 108    | 7 – 10                        |
| Miles of Onshore Pipeline              | 60 – 120      | 330         | 0                             | 75          | 0                             |
| Miles of Offshore Pipeline             | 125 – 160     | 100 - 260   | 50 – 100                      | 40 – 125    | 25 – 55                       |
| Landfalls                              | 2             | 1           | 1                             | 2 – 4       | 1                             |
| Vessel Trips/Week                      | 3 – 6         | 1 – 4       | 1                             | 2 – 8       | 1                             |
| Helicopter Trips/Week                  | 30 – 60       | 10 - 40     | 10                            | 10 – 40     | 5                             |
| New Shore Bases                        | 0             | 1           | 1                             | 0           | 1                             |
| New Process Facilities                 | 2             | 1           | 1                             | 0           | 1                             |
| New Waste Facilities                   | 0             | 1           | 1                             | 0           | 1                             |
| Drill Muds/Well (bbl)                  |               |             |                               |             |                               |
| Exploration/Delineation                | 255           | 565         | 350                           | 435         | 565                           |
| Development/Production                 | 290           | 320         | 200                           | 220         | 380                           |
| Drill Cuttings/Well (bbl)              |               |             |                               |             |                               |
| Exploration/Delineation                | 1,520         | 1,970       | 940                           | 1,275       | 1,970                         |
| Development/Production                 | 2,550         | 2,830       | 1,520                         | 1,600       | 3,335                         |
| Bottom Area Disturbed – Platforms (ha) | 18 – 36       | 6 – 24      | 6                             | 4 – 12      | 3                             |
| Bottom Area Disturbed – Pipelines (ha) | 95 – 120      | 75 – 195    | 40 – 75                       | 30 – 95     | 20 – 40                       |
| Platform Removals with Explosives      | 0             | 0           | 0                             | 0           | 0                             |

Assumptions

- All cuttings from exploration and delineation wells will be discharged at the offshore well site.
- All cuttings from production and development wells will be disposed of subsurface.
- 80% of drilling muds will be recycled.
- 20% of drilling muds for exploration and delineation wells will be discharged at the well site.
- All spent drilling muds for production and development wells will be disposed of subsurface or at onshore waste disposal sites.
- All produced water will be reinjected.

**Table 4-1c. Oil-Spill Rates for Spill Sources (Spill/Billion Barrels)**

| Spill Source                   | Spills $\geq$ 1,000 bbl               |                                            | Spills $\geq$ 10,000 bbl               |                                            |
|--------------------------------|---------------------------------------|--------------------------------------------|----------------------------------------|--------------------------------------------|
|                                | Spill Rate Entire Record <sup>1</sup> | Spill Rates for Last 15 Years <sup>2</sup> | Spill Rates Entire Record <sup>1</sup> | Spill Rates for Last 15 Years <sup>2</sup> |
| OCS Platforms                  | 0.32                                  | <0.13                                      | 0.12                                   | <0.05                                      |
| OCS Pipelines                  | 1.33                                  | 1.38                                       | 0.33                                   | 0.34                                       |
| Tankers U.S. Waters            | 1.03                                  | 0.72                                       | 0.43                                   | 0.25                                       |
| ANS <sup>3</sup> Crude Tankers | 0.88                                  | 0.92                                       | 0.23                                   | 0.34                                       |

NOTE: Spill rates are expressed as number of spills (greater than or equal to a certain size) per billion barrels (Bbbl) handled (Bbbl = 1,000,000,000 bbl). Spills  $\geq$  10,000 bbl are a subset of spills  $\geq$  1,000 bbl.

<sup>1</sup> Entire record: OCS platforms & pipelines spill rates calculated on 1964-1999 data; tankers in U.S. waters and ANS tankers spill rates calculated on 1974 – 1999 data.

<sup>2</sup> Last 15 Years: spill rates calculated on 1985 – 1999 data.

<sup>3</sup> ANS = Alaska North Slope crude oil tankers; spill rates based on historic spills from carriers of ANS crude.

Source: Anderson and LaBelle (2001).

**Table 4-1d. Oil-Spill Rates for OCS Planning Areas (by Production/Transportation)**

| Region                                                                                                                            | Production/Transportation Scenario                                                                  | Entire Record | Last 15 Years <sup>2</sup> |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------|----------------------------|
| <b>Spills <math>\geq</math> 1,000 bbl</b>                                                                                         |                                                                                                     |               |                            |
| WGOM, CGOM                                                                                                                        | 100% Platform, 90% Pipeline<br>10% Tanker U.S. Waters                                               | 1.62          | 1.44                       |
| EGOM, Cook Inlet                                                                                                                  | 100% Platform, 100% Pipeline                                                                        | 1.65          | 1.51                       |
| Beaufort, Chukchi<br>Norton Basin                                                                                                 | 100% Platform, 100% Pipeline,<br>100% ANS <sup>3</sup> Tankers                                      | 2.53          | 2.43                       |
| <b>Spills <math>\geq</math> 10,000 bbl</b>                                                                                        |                                                                                                     |               |                            |
| WGOM, CGOM                                                                                                                        | 100% Platform, 90% Pipeline<br>10% Tanker U.S. Waters                                               | 0.46          | 0.38                       |
| EGOM, Cook Inlet                                                                                                                  | 100% Platform, 100% Pipeline                                                                        | 0.45          | 0.39                       |
| Beaufort, Chukchi<br>Norton Basin                                                                                                 | 100% Platform, 100% Pipeline,<br>100% ANS <sup>3</sup> Tankers                                      | 0.68          | 0.73                       |
| <b>Spills <math>\geq</math> 500<sup>3</sup> bbl Using Onshore North Slope Rate &amp; Trans-Alaska Pipeline System (TAPS) Rate</b> |                                                                                                     |               |                            |
| <b>1985 – 1998:</b> facilities – 0.48, pipelines – 0.12, total – 0.60 spills/Bbbl <b>1985 – 1998:</b> TAPS – 0.12 spills/Bbbl     |                                                                                                     |               |                            |
| Beaufort, Chukchi<br>Norton Basin                                                                                                 | 100% Platform, 100% Pipeline<br>100% TAPS, 100% ANS <sup>4</sup> Crude<br>Tankers 1,000+ bbl Spills |               | 1.64                       |
| Cook Inlet                                                                                                                        | 100% Platform, 100% Pipeline,<br>No TAPS, No ANS <sup>4</sup> Tankers                               |               | 0.60                       |

Note: Spill rates are expressed as number of spills (greater than or equal to a certain size) per billion barrels (Bbbl) handled (Bbbl = 1,000,000,000 bbl). Spills  $\geq$  10,000 bbl are a subset of spills  $\geq$  1,000 bbl.

WGOM, CGOM, EGOM = Western, Central, and Eastern Gulf of Mexico

<sup>1</sup> Entire record: OCS platforms & pipelines spill rates are calculated on 1964 – 1999 data; tankers in U.S. waters and ANS tankers spill rates are calculated on 1974 – 1999 data; OCS platform and pipeline data are based on U.S. Gulf of Mexico and offshore California data.

<sup>2</sup> Last 15 years: spill rates calculated on 1985 – 1999 data.

<sup>3</sup> ANS = Alaska North Slope crude oil tankers; spill rates based on historic spills from carriers of ANS crude.

<sup>4</sup> Areas in Alaska have an alternative estimate of the number of spills likely to occur by using Alaska data for the platform and pipeline spill occurrence estimates. Estimates of the mean number of spills and the probability of one or more spills occurring using Alaska rates are based on spill rates calculated on 1985 – 1998 data of  $\geq$  500 bbl and greater from Alaska onshore North Slope facilities and pipelines in the TAPS. Using these rates as a proxy for spills  $\geq$  1,000 bbl is conservative, i.e., they should result in an overestimate of the number of spills  $\geq$  1,000 bbl since spill occurrence frequency varies inversely to spill size. Spill rates from ANS crude tanker spills  $\geq$  1,000 bbl were also used for areas where the oil is assumed to be transported by tanker from Alaska to the U.S. west coast.

Source: Anderson and LaBelle (2001).

**Table 4.1e. The Proposed Action (Alternative 1) – Oil-Spill Assumptions**

| Scenario Elements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Gulf of Mexico Region                                 |                                                                                              |                          | Alaska Region                            |                                                      |                   |                                        | Pacific Region                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------|--------------------------|------------------------------------------|------------------------------------------------------|-------------------|----------------------------------------|----------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Western                                               | Central                                                                                      | Eastern                  | Beaufort Sea                             | Chukchi Sea                                          | Cook Inlet        | Gulf of Alaska                         |                                        |
| Oil Production (BBO)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.68 – 1.31                                           | 1.38 – 3.27                                                                                  | 0.10 – 0.17              | 1.02 – 1.71                              | 0.96 – 2.42                                          | 0.28 – 0.34       | 0                                      | 0                                      |
| Years of Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 40                                                    | 40                                                                                           | 40                       | 35                                       | 40                                                   | 25                | N/A                                    | N/A                                    |
| Large Oil Spills from OCS Activity*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1 Shallow Platform Spill<br><br>1 Deep Pipeline Spill | 1 Shallow Platform Spill<br><br>1 Shallow, 1 Deep Pipeline Spills<br><br>1 Deep Tanker Spill | 1 Shallow Pipeline Spill | 1 Platform Spill<br><br>1 Pipeline Spill | 1 Platform Spill<br><br>2 Pipeline Spills in Chukchi | 1 Pipeline Spill  | 1 Tanker Spill (Arctic OCS production) | 1 Tanker Spill (Arctic OCS production) |
| Prob. 1 + Spills ≥ 1,000 bbl (GOM)<br>≥ 500 bbl (AK)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 62 – 85%                                              | 86 – 99%                                                                                     | 14 – 23%                 | 81 – 94%                                 | up to 98%                                            | 16 – 18%          | –                                      | –                                      |
| Spills < 50 bbl<br>Mean No. Spills<br>Prob. 1+ Spills**                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 60 – 120<br>**                                        | 125 – 300<br>**                                                                              | 9 – 15<br>**             | 90 – 150<br>**                           | 85 – 220<br>**                                       | 25 – 30<br>**     | –                                      | –                                      |
| Spills 50 – 999 bbl<br>Mean No. Spills<br>Prob. 1+ Spills**                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 5 – 9<br>99 – **%                                     | 10 – 23<br>**                                                                                | 1<br>50 – 69%            | 7 – 12<br>**                             | 7 – 17<br>**                                         | 2 – 3<br>85 – 90% | –                                      | –                                      |
| <p>* Large spill sizes: pipeline: 4,600 bbl; platform: 1,500 bbl; tanker (GOM): 5,300 bbl; tanker (west coast): 7,800 bbl</p> <p>** Estimated probability greater than 99.5%</p> <p>OCS Spill Rates, Gulf of Mexico and offshore California spills, 1985-1999:</p> <p>Spills 1.1 – 49.9 bbl: 88.46 spills per Bbbl    6.1 bbl average size    3.0 bbl median size</p> <p>Spills 50 – 999 bbl: 6.72 spills per Bbbl    167.7 bbl average size    100.0 bbl median size</p> <p>Estimates of the probability of one or more spills occurring using Alaska rates are based on spill rates calculated on 1985-1998 data of spills ≥ 500 bbl from Alaska onshore North Slope facilities and pipelines in the Trans-Alaska Pipeline System. Using these rates as a proxy for spills ≥ 1,000 bbl is conservative, i.e., they should result in an overestimate of the number of spills ≥ 1,000 barrels since spill occurrence frequency varies inversely to spill size. Spill rates from ANS crude tanker spills ≥ 1,000 bbl were also used for areas where the oil is assumed to be transported by tanker from Alaska to the U.S. west coast.</p> |                                                       |                                                                                              |                          |                                          |                                                      |                   |                                        |                                        |

**Table 4-2a. Slow the Pace of Leasing (Alternative 2) – Exploration and Development Scenario for the Gulf of Mexico Region**

| Scenario Elements                      | Gulf of Mexico Region |               |               |
|----------------------------------------|-----------------------|---------------|---------------|
|                                        | Western               | Central       | Eastern       |
| Sales                                  | 5                     | 5             | 1             |
| Oil Production (BBO)                   | 0.68 – 1.31           | 1.38 – 3.27   | 0.065 – 0.085 |
| Gas Production (Tcf)                   | 4.05 – 7.20           | 7.95 – 16.50  | 0.265 – 0.340 |
| Years of Activity                      | 40                    | 40            | 40            |
| Platforms                              | 50 – 75               | 130 – 240     | 1 – 2         |
| Exploration and Delineation Wells      | 185 – 575             | 555 – 1,235   | 11 – 13       |
| Development and Production Wells       | 490 – 825             | 890 – 1,760   | 19 – 27       |
| Miles of Pipeline                      | 500 – 1,500           | 800 – 2,400   | 150 – 200     |
| Landfalls                              | up to 5               | up to 5       | 1             |
| Vessel Trips/Week                      | 60 – 100              | 175 – 350     | 2 – 3         |
| Helicopter Trips/Week                  | 75 – 125              | 225 – 425     | 2 – 4         |
| New Shore Bases                        | up to 3               | 0 – 1         | 0             |
| New Process Facilities                 | 0                     | 0             | 0             |
| New Waste Facilities                   | 1                     | 3             | 0             |
| Drill Muds/Well (bbl)                  |                       |               |               |
| Exploration/Delineation                | 7,860                 | 7,860         | 7,860         |
| Development/Production                 | 5,800                 | 5,800         | 5,800         |
| Drill Cuttings/Well (bbl)              |                       |               |               |
| Exploration/Delineation                | 2,680                 | 2,680         | 2,680         |
| Development/Production                 | 1,630                 | 1,630         | 1,630         |
| Produced Water/Well (bbl)              |                       |               |               |
| Oil Well                               | 450                   | 450           | 450           |
| Gas Well                               | 68                    | 68            | 68            |
| Bottom Area Disturbed – Platforms (ha) | 75 – 115              | 200 – 350     | 2 – 4         |
| Bottom Area Disturbed – Pipeline (ha)  | 700 – 2,000           | 1,100 – 3,300 | 210 – 280     |
| Platform Removals with Explosives      | 40 – 60               | 100 – 190     | 0             |

**Table 4-2b. Slow the Pace of Leasing (Alternative 2) – Exploration and Development Scenario for the Alaska Region**

| Scenario Elements                      | Alaska Region |             |                               |             |                               |
|----------------------------------------|---------------|-------------|-------------------------------|-------------|-------------------------------|
|                                        | Beaufort Sea  | Chukchi Sea | Hope Basin                    | Cook Inlet  | Norton Basin                  |
| Sales                                  | 1 or 2*       | 1           | 1                             | 1           | 1                             |
| Oil Production (BBO)                   | 0.68 – 1.14   | 0.96 – 1.21 | 0.005 – 0.010<br>(condensate) | 0.14 – 0.17 | 0.005 – 0.008<br>(condensate) |
| Gas Production (Tcf)                   | None          | None        | 0.145 – 0.357                 | 0.19 – 0.29 | 0.260 – 0.400                 |
| Years of Activity                      | 25            | 30          | 20                            | 30          | 20                            |
| Platforms                              | 4 – 8         | 2 – 4       | 1                             | 1 – 3       | 1                             |
| Exploration and Delineation Wells      | 12 – 20       | 6 – 12      | 3 – 5                         | 4 – 9       | 3 – 5                         |
| Development and Production Wells       | 130 – 220     | 106 – 160   | 4 – 9                         | 42 – 54     | 7 – 10                        |
| Miles of Onshore Pipeline              | 60 – 120      | 330         | 0                             | 75          | 0                             |
| Miles of Offshore Pipeline             | 125 – 200     | 100 – 160   | 20 – 70                       | 25 – 75     | 25 – 55                       |
| Landfalls                              | 2             | 1           | 1                             | 1 – 2       | 1                             |
| Vessel Trips/Week                      | 2 – 4         | 1 – 2       | 1                             | 1 – 4       | 1                             |
| Helicopter Trips/Week                  | 20 – 40       | 10 - 20     | 5                             | 5 – 20      | 5                             |
| New Shore Bases                        | 0             | 1           | 1                             | 0           | 1                             |
| New Process Facilities                 | 2             | 1           | 1                             | 0           | 1                             |
| New Waste Facilities                   | 0             | 1           | 1                             | 0           | 1                             |
| Drill muds/Well (bbl)                  |               |             |                               |             |                               |
| Exploration/Delineation                | 255           | 565         | 350                           | 435         | 565                           |
| Development/Production                 | 290           | 320         | 200                           | 220         | 380                           |
| Drill Cuttings/Well (bbl)              |               |             |                               |             |                               |
| Exploration/Delineation                | 1,520         | 1,970       | 940                           | 1,275       | 1,970                         |
| Development/Production                 | 2,550         | 2,830       | 1,520                         | 1,600       | 3,335                         |
| Bottom Area Disturbed – Platforms (ha) | 12 – 24       | 6 – 12      | 3                             | 2 – 8       | 3                             |
| Bottom Area Disturbed – Pipelines (ha) | 95 – 150      | 75 – 120    | 15 – 50                       | 20 – 70     | 20 – 40                       |
| Platform Removals with Explosives      | 0             | 0           | 0                             | 0           | 0                             |

\* Amount of oil and gas production and levels of activity in the Beaufort Sea assume 2 sales.

**Table 4.2c. Slow the Pace of Leasing (Alternative 2) – Oil-Spill Assumptions**

| Scenario Elements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Gulf of Mexico Region                                 |                                                                                              |                          | Alaska Region    |                                                     |                  |                                        | Pacific Region                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------|--------------------------|------------------|-----------------------------------------------------|------------------|----------------------------------------|----------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Western                                               | Central                                                                                      | Eastern                  | Beaufort Sea     | Chukchi Sea                                         | Cook Inlet       | Gulf of Alaska                         |                                        |
| Oil Production (BBO)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.68 – 1.31                                           | 1.38 – 3.27                                                                                  | 0.065 – 0.085            | 0.68 – 1.14      | 0.96 – 1.21                                         | 0.14 – 0.17      | 0                                      | 0                                      |
| Years of Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 40                                                    | 40                                                                                           | 40                       | 35               | 40                                                  | 25               | N/A                                    | N/A                                    |
| Large Oil Spills From OCS Activity*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1 Shallow Platform Spill<br><br>1 Deep Pipeline Spill | 1 Shallow Platform Spill<br><br>1 Shallow, 1 Deep Pipeline Spills<br><br>1 Deep Tanker Spill | 1 Shallow Pipeline Spill | 1 Pipeline Spill | 1 Platform Spill<br><br>1 Pipeline Spill in Chukchi | 1 Pipeline Spill | 1 Tanker Spill (Arctic OCS production) | 1 Tanker Spill (Arctic OCS production) |
| Prob. 1 + Spills ≥ 1,000 bbl (GOM)<br>≥ 500 bbl (AK)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 62 – 85%                                              | 86 – 99%                                                                                     | 10 – 12%                 | 67 – 85%         | 79 – 86%                                            | 8 – 10%          | –                                      | –                                      |
| Spills < 50 bbl<br>Mean No. Spills<br>Prob. 1+ Spills**                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 60 – 120<br>**                                        | 125 – 300<br>**                                                                              | 6 – 8<br>**              | 60 – 100<br>**   | 85 – 110<br>**                                      | 13 – 15<br>**    | –                                      | –                                      |
| Spills 50 – 999 bbl<br>Mean No. Spills<br>Prob. 1+ Spills**                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 5 – 9<br>99 – **%                                     | 10 – 23<br>**                                                                                | 1<br>50 – 69%            | 5 - 8<br>**      | 7 – 8<br>**                                         | 1<br>62 – 69%    | –                                      | –                                      |
| <p>* Large spill sizes: pipeline: 4,600 bbl; platform: 1,500 bbl; tanker (GOM): 5,300 bbl; tanker (west coast): 7,800 bbl</p> <p>** Estimated probability greater than 99.5%</p> <p>OCS Spill Rates, Gulf of Mexico and offshore California spills, 1985-1999:</p> <p>Spills 1.1 – 49.9 bbl: 88.46 spills per Bbbl    6.1 bbl average size    3.0 bbl median size</p> <p>Spills 50 – 999 bbl: 6.72 spills per Bbbl    167.7 bbl average size    100.0 bbl median size</p> <p>Estimates of the probability of one or more spills occurring using Alaska rates are based on spill rates calculated on 1985-1998 data of spills ≥ 500 bbl from Alaska onshore North Slope facilities and pipelines in the Trans-Alaska Pipeline System. Using these rates as a proxy for spills ≥ 1,000 bbl is conservative, i.e., they should result in an overestimate of the number of spills ≥ 1,000 barrels since spill occurrence frequency varies inversely to spill size. Spill rates from ANS crude tanker spills ≥ 1,000 bbl were also used for areas where the oil is assumed to be transported by tanker from Alaska to the U.S. west coast.</p> |                                                       |                                                                                              |                          |                  |                                                     |                  |                                        |                                        |



**Table 4-3a. Exclude Some Planning Areas (Alternative 3) – Exploration and Development Scenario for the Gulf of Mexico Region**

| Scenario Elements                      | Gulf of Mexico Region |               |         |
|----------------------------------------|-----------------------|---------------|---------|
|                                        | Western               | Central       | Eastern |
| Sales                                  | 5                     | 5             | None    |
| Oil Production (BBO)                   | 0.68 – 1.31           | 1.38 – 3.27   | None    |
| Gas Production (Tcf)                   | 4.05 – 7.20           | 7.95 – 16.50  | None    |
| Years of Activity                      | 40                    | 40            | –       |
| Platforms                              | 50 – 75               | 130 – 240     | –       |
| Exploration and Delineation Wells      | 185 – 575             | 555 – 1,235   | –       |
| Development and Production Wells       | 490 – 825             | 890 – 1,760   | –       |
| Miles of Pipeline                      | 500 – 1,500           | 800 – 2,400   | –       |
| Landfalls                              | 0 – 5                 | 0 – 5         | –       |
| Vessel Trips/Week                      | 60 – 100              | 175 – 350     | –       |
| Helicopter Trips/Week                  | 75 – 125              | 225 – 425     | –       |
| New Shore Bases                        | 0 – 3                 | 0 – 1         | –       |
| New Process Facilities                 | 0                     | 0             | –       |
| New Waste Facilities                   | 2                     | 4             | –       |
| Drill Muds/Well (bbl)                  |                       |               | –       |
| Exploration/Delineation                | 7,860                 | 7,860         |         |
| Development/Production                 | 5,800                 | 5,800         |         |
| Drill Cuttings/Well (bbl)              |                       |               | –       |
| Exploration/Delineation                | 2,680                 | 2,680         |         |
| Development/Production                 | 1,630                 | 1,630         |         |
| Produced Water/Well (bbl)              |                       |               | –       |
| Oil Well                               | 450                   | 450           |         |
| Gas Well                               | 68                    | 68            |         |
| Bottom Area Disturbed – Platforms (ha) | 75 – 115              | 200 – 350     | –       |
| Bottom Area Disturbed – Pipeline (ha)  | 700 – 2,000           | 1,100 – 3,300 | –       |
| Platform Removals with Explosives      | 40 – 60               | 100 – 190     | –       |

**Table 4-3b. Exclude Some Planning Areas (Alternative 3) – Exploration and Development Scenario for the Alaska Region**

| Scenario Elements                      | Alaska Region |             |            |             |              |
|----------------------------------------|---------------|-------------|------------|-------------|--------------|
|                                        | Beaufort Sea  | Chukchi Sea | Hope Basin | Cook Inlet  | Norton Basin |
| Sales                                  | 3             | 2           | None       | 2           | None         |
| Oil Production (BBO)                   | 1.02 – 1.71   | 0.96 – 2.42 | None       | 0.28 – 0.34 | None         |
| Gas Production (Tcf)                   | None          | None        | None       | 0.38 – 0.58 | None         |
| Years of Activity                      | 30            | 35          | –          | 35          | –            |
| Platforms                              | 6 – 12        | 2 – 8       | –          | 2 – 6       | –            |
| Exploration and Delineation Wells      | 18 – 30       | 6 – 24      | –          | 8 – 18      | –            |
| Development and Production Wells       | 190 – 325     | 106 – 320   | –          | 84 – 108    | –            |
| Miles of Onshore Pipeline              | 60 – 120      | 330         | –          | 75          | –            |
| Miles of Offshore Pipeline             | 125 – 160     | 100 – 260   | –          | 40 – 125    | –            |
| Landfalls                              | 2             | 1           | –          | 2 – 4       | –            |
| Vessel Trips/Week                      | 3 – 6         | 1 – 4       | –          | 2 – 8       | –            |
| Helicopter Trips/Week                  | 30 – 60       | 10 – 40     | –          | 10 – 40     | –            |
| New Shore Bases                        | 0             | 1           | –          | 0           | –            |
| New Process Facilities                 | 2             | 1           | –          | 0           | –            |
| New Waste Facilities                   | 0             | 1           | –          | 0           | –            |
| Drill Muds/Well (bbl)                  |               |             | –          |             | –            |
| Exploration/Delineation                | 255           | 565         |            | 435         |              |
| Development/Production                 | 290           | 320         |            | 220         |              |
| Drill Cuttings/Well (bbl)              |               |             | –          |             | –            |
| Exploration/Delineation                | 1,520         | 1,970       |            | 1,275       |              |
| Development/Production                 | 2,550         | 2,830       |            | 1,600       |              |
| Bottom Area Disturbed – Platforms (ha) | 18 – 36       | 6 – 24      | –          | 4 – 12      | –            |
| Bottom Area Disturbed – Pipelines (ha) | 95 – 120      | 75 – 195    | –          | 30 – 95     | –            |
| Platform Removals with Explosives      | 0             | 0           | –          | 0           | –            |

Assumptions

- All cuttings from exploration and delineation wells will be discharged at the offshore well site.
- All cuttings from production and development wells will be disposed of subsurface.
- 80% of drilling muds will be recycled.
- 20% of drilling muds for exploration and delineation wells will be discharged at the well site.
- All spent drilling muds for production and development wells will be disposed of subsurface or at onshore waste disposal sites.
- All produced water will be reinjected.

**Table 4.3c. Exclude Some Planning Areas (Alternative 3) – Oil-Spill Assumptions**

| Scenario Elements                                           | Gulf of Mexico Region                                 |                                                                                              |         | Alaska Region                            |                                                      |                   |                                        | Pacific Region                         |
|-------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------|---------|------------------------------------------|------------------------------------------------------|-------------------|----------------------------------------|----------------------------------------|
|                                                             | Western                                               | Central                                                                                      | Eastern | Beaufort Sea                             | Chukchi Sea                                          | Cook Inlet        | Gulf of Alaska                         |                                        |
| Oil Production (BBO)                                        | 0.68 – 1.31                                           | 1.38 – 3.27                                                                                  | None    | 1.02 – 1.71                              | 0.96 – 2.42                                          | 0.28 – 0.34       | 0                                      | 0                                      |
| Years of Activity                                           | 40                                                    | 40                                                                                           | 40      | 35                                       | 40                                                   | 25                | N/A                                    | N/A                                    |
| Large Oil Spills from OCS Activity*                         | 1 Shallow Platform Spill<br><br>1 Deep Pipeline Spill | 1 Shallow Platform Spill<br><br>1 Shallow, 1 Deep Pipeline Spills<br><br>1 Deep Tanker Spill | –       | 1 Platform Spill<br><br>1 Pipeline Spill | 1 Platform Spill<br><br>2 Pipeline Spills in Chukchi | 1 Pipeline Spill  | 1 Tanker Spill (Arctic OCS production) | 1 Tanker Spill (Arctic OCS production) |
| Prob. 1 + Spills ≥ 1,000 bbl (GOM) ≥ 500 bbl (AK)           | 62 – 85%                                              | 86 – 99%                                                                                     | –       | 81 – 94%                                 | up to 98%                                            | 16 – 18%          | –                                      | –                                      |
| Spills < 50 bbl<br>Mean No. Spills<br>Prob. 1+ Spills**     | 60 – 120<br>**                                        | 125 – 300<br>**                                                                              | –       | 90 – 150<br>**                           | 85 – 220<br>**                                       | 25 – 30<br>**     | –                                      | –                                      |
| Spills 50 – 999 bbl<br>Mean No. Spills<br>Prob. 1+ Spills** | 5 – 9<br>99 – **%                                     | 10 – 23<br>**                                                                                | –       | 7 – 12<br>**                             | 7 – 17<br>**                                         | 2 – 3<br>85 – 90% | –                                      | –                                      |

\* Large spill sizes: pipeline: 4,600 bbl; platform: 1,500 bbl; tanker (GOM): 5,300 bbl; tanker (west coast): 7,800 bbl

\*\* Estimated probability greater than 99.5%

OCS Spill Rates, Gulf of Mexico and offshore California spills, 1985-1999:  
 Spills 1.1 – 49.9 bbl: 88.46 spills per Bbbl    6.1 bbl average size    3.0 bbl median size  
 Spills 50 – 999 bbl: 6.72 spills per Bbbl    167.7 bbl average size    100.0 bbl median size

Estimates of the probability of one or more spills occurring using Alaska rates are based on spill rates calculated on 1985-1998 data of spills ≥ 500 bbl from Alaska onshore North Slope facilities and pipelines in the Trans-Alaska Pipeline System. Using these rates as a proxy for spills ≥ 1,000 bbl is conservative, i.e., they should result in an overestimate of the number of spills ≥ 1,000 barrels since spill occurrence frequency varies inversely to spill size. Spill rates from ANS crude tanker spills ≥ 1,000 bbl were also used for areas where the oil is assumed to be transported by tanker from Alaska to the U.S. west coast.

**Table 4-4a. Accelerated Leasing (Alternative 4) – Exploration and Development Scenario for the Gulf of Mexico Region**

| Scenario Elements                      | Gulf of Mexico Region |               |                  |
|----------------------------------------|-----------------------|---------------|------------------|
|                                        | Western               | Central       | Eastern          |
| Sales                                  | 5                     | 5             | 3                |
| Oil Production (BBO)                   | 0.68 – 1.31           | 1.38 – 3.27   | 0.124 – 0.255    |
| Gas Production (Tcf)                   | 4.05 – 7.20           | 7.95 – 16.50  | 0.495 – 1.02     |
| Years of Activity                      | 40                    | 40            | 45               |
| Platforms                              | 50 – 75               | 130 – 240     | 3 – 5            |
| Exploration and Delineation Wells      | 185 – 575             | 555 – 1,235   | 21 – 39          |
| Development and Production Wells       | 490 – 825             | 890 – 1,760   | 38 – 78          |
| Miles of Pipeline                      | 500 – 1,500           | 800 – 2,400   | 250 – 400        |
| Landfalls                              | up to 5               | up to 5       | 1 – 3 (gas only) |
| Vessel Trips/Week                      | 60 – 100              | 175 – 350     | 5 – 8            |
| Helicopter Trips/Week                  | 75 – 125              | 225 – 425     | 6 – 10           |
| New Shore Bases                        | up to 3               | 0 – 1         | 0                |
| New Process Facilities                 | 0                     | 0             | 0                |
| New Waste Facilities                   | 2                     | 4             | 0                |
| Drill Muds/Well (bbl)                  |                       |               |                  |
| Exploration/Delineation                | 7,860                 | 7,860         | 7,860            |
| Development/Production                 | 5,800                 | 5,800         | 5,800            |
| Drill Cuttings/Well (bbl)              |                       |               |                  |
| Exploration/Delineation                | 2,680                 | 2,680         | 2,680            |
| Development/Production                 | 1,630                 | 1,630         | 1,630            |
| Produced Water/Well (bbl)              |                       |               |                  |
| Oil Well                               | 450                   | 450           | 450              |
| Gas Well                               | 68                    | 68            | 68               |
| Bottom Area Disturbed – Platforms (ha) | 75 – 115              | 200 – 350     | 6 – 10           |
| Bottom Area Disturbed – Pipeline (ha)  | 700 – 2,000           | 1,100 – 3,300 | 350 – 560        |
| Platform Removals with Explosives      | 40 – 60               | 100 – 190     | 0                |

\* Different than the Proposal (alternative 1)

**Table 4-4b. Accelerated Leasing (Alternative 4) – Exploration and Development Scenario for the Alaska Region**

| Scenario Elements                      | Alaska Region |             |                               |             |                               |
|----------------------------------------|---------------|-------------|-------------------------------|-------------|-------------------------------|
|                                        | Beaufort Sea  | Chukchi Sea | Hope Basin                    | Cook Inlet  | Norton Basin                  |
| Sales                                  | 5             | 2           | 2                             | 2           | 1                             |
| Oil Production (BBO)                   | 1.70 – 2.85   | 0.96 – 2.42 | 0.010 – 0.020<br>(condensate) | 0.28 – 0.34 | 0.005 – 0.008<br>(condensate) |
| Gas Production (Tcf)                   | None          | None        | 0.290 – 0.714                 | 0.38 – 0.58 | 0.260 – 0.400                 |
| Years of Activity                      | 35            | 35          | 25                            | 35          | 20                            |
| Platforms                              | 10 – 20       | 2 – 8       | 2                             | 2 – 6       | 1                             |
| Exploration and Delineation Wells      | 30 – 50       | 6 – 24      | 6 – 10                        | 8 – 18      | 3 – 5                         |
| Development and Production Wells       | 320 – 545     | 106 – 320   | 8 – 18                        | 84 – 108    | 7 – 10                        |
| Miles of Onshore Pipeline              | 75 – 130      | 330         | 0                             | 75          | 0                             |
| Miles of Offshore Pipeline             | 140 – 180     | 100 – 260   | 50 – 100                      | 40 – 125    | 25 – 55                       |
| Landfalls                              | 2 – 3         | 1           | 1                             | 2 – 4       | 1                             |
| Vessel Trips/Week                      | 5 – 10        | 1 – 4       | 1                             | 2 – 8       | 1                             |
| Helicopter Trips/Week                  | 50 – 100      | 10 – 40     | 10                            | 10 – 40     | 5                             |
| New Shore Bases                        | 0             | 1           | 1                             | 0           | 1                             |
| New Process Facilities                 | 2 – 3         | 1           | 1                             | 0           | 1                             |
| New Waste Facilities                   | 0             | 1           | 1                             | 0           | 1                             |
| Drill Muds/Well (bbl)                  |               |             |                               |             |                               |
| Exploration/Delineation                | 255           | 565         | 350                           | 435         | 565                           |
| Development/Production                 | 290           | 320         | 200                           | 220         | 380                           |
| Drill Cuttings/Well (bbl)              |               |             |                               |             |                               |
| Exploration/Delineation                | 1,520         | 1,970       | 940                           | 1,275       | 1,970                         |
| Development/Production                 | 2,550         | 2,830       | 1,520                         | 1,600       | 3,335                         |
| Bottom Area Disturbed – Platforms (ha) | 30 – 60       | 6 – 24      | 6                             | 4 – 12      | 3                             |
| Bottom Area Disturbed – Pipelines (ha) | 100 – 135     | 75 – 195    | 40 – 75                       | 30 – 95     | 20 – 40                       |
| Platform Removals with Explosives      | 0             | 0           | 0                             | 0           | 0                             |

Assumptions

- All cuttings from exploration and delineation wells will be discharged at the offshore well site.
- All cuttings from production and development wells will be disposed of subsurface.
- 80% of drilling muds will be recycled.
- 20% of drilling muds for exploration and delineation wells will be discharged at the well site.
- All spent drilling muds for production and development wells will be disposed of subsurface or at onshore waste disposal sites.
- All produced water will be reinjected.

**Table 4.4c. Accelerated Leasing (Alternative 4) – Oil Spill Assumptions**

| Scenario Elements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Gulf of Mexico Region                                 |                                                                                              |                          | Alaska Region                             |                                                      |                   | Pacific Region                         |                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------|--------------------------|-------------------------------------------|------------------------------------------------------|-------------------|----------------------------------------|----------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Western                                               | Central                                                                                      | Eastern                  | Beaufort Sea                              | Chukchi Sea                                          | Cook Inlet        |                                        | Gulf of Alaska                         |
| Oil Production (BBO)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.68 – 1.31                                           | 1.38 – 3.27                                                                                  | 0.124 – 0.255            | 1.70 – 2.85                               | 0.96 – 2.42                                          | 0.28 – 0.34       | 0                                      | 0                                      |
| Years of Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 40                                                    | 40                                                                                           | 40                       | 35                                        | 40                                                   | 25                | N/A                                    | N/A                                    |
| Large Oil Spills from OCS Activity*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1 Shallow Platform Spill<br><br>1 Deep Pipeline Spill | 1 Shallow Platform Spill<br><br>1 Shallow, 1 Deep Pipeline Spills<br><br>1 Deep Tanker Spill | 1 Shallow Pipeline Spill | 1 Platform Spill<br><br>2 Pipeline Spills | 1 Platform Spill<br><br>2 Pipeline Spills in Chukchi | 1 Pipeline Spill  | 1 Tanker Spill (Arctic OCS production) | 1 Tanker Spill (Arctic OCS production) |
| Prob. 1 + Spills ≥ 1,000 bbl (GOM)<br>≥ 500 bbl (AK)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 62 – 85%                                              | 86 – 99%                                                                                     | 17 – 32%                 | 94 – 99%                                  | up to 98%                                            | 16 – 18%          | –                                      | –                                      |
| Spills < 50 bbl<br>Mean No. Spills<br>Prob. 1+ Spills**                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 60 – 120<br>**                                        | 125 – 300<br>**                                                                              | 11 – 23<br>**            | 155 – 260<br>**                           | 85 – 220<br>**                                       | 25 – 30<br>**     | –                                      | –                                      |
| Spills 50 – 999 bbl<br>Mean No. Spills<br>Prob. 1+ Spills**                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5 – 9<br>99 – **%                                     | 10 – 23<br>**                                                                                | 1 – 2<br>57 – 83%        | 12 – 20<br>**                             | 7 – 17<br>**                                         | 2 – 3<br>85 – 90% | –                                      | –                                      |
| <p>* Large spill sizes: pipeline: 4,600 bbl; platform: 1,500 bbl; tanker (GOM): 5,300 bbl; tanker (west coast): 7,800 bbl</p> <p>** Estimated probability greater than 99.5%</p> <p>OCS Spill Rates, Gulf of Mexico and offshore California spills, 1985-1999:<br/>         Spills 1.1 – 49.9 bbl: 88.46 spills per Bbbl    6.1 bbl average size    3.0 bbl median size<br/>         Spills 50 – 999 bbl: 6.72 spills per Bbbl    167.7 bbl average size    100.0 bbl median size</p> <p>Estimates of the probability of one or more spills occurring using Alaska rates are based on spill rates calculated on 1985-1998 data of spills ≥ 500 bbl from Alaska onshore North Slope facilities and pipelines in the Trans-Alaska Pipeline System. Using these rates as a proxy for spills ≥ 1,000 bbl is conservative, i.e., they should result in an overestimate of the number of spills ≥ 1,000 barrels since spill occurrence frequency varies inversely to spill size. Spill rates from ANS crude tanker spills ≥ 1,000 bbl were also used for areas where the oil is assumed to be transported by tanker from Alaska to the U.S. west coast.</p> |                                                       |                                                                                              |                          |                                           |                                                      |                   |                                        |                                        |

**Table 4-5a. Oil Consumption by End-Use Sector**

| <b>End-Use Sector</b>                                    | <b>Transportation</b> | <b>Industrial</b> | <b>Residential and Commercial</b> | <b>Electricity Generation</b> | <b>Total</b> |
|----------------------------------------------------------|-----------------------|-------------------|-----------------------------------|-------------------------------|--------------|
| 1999 Consumption (quadrillion Btu)                       | 25.4                  | 9.6               | 2.1                               | .9                            | 38.0         |
| The Sector as a Percentage of Total 1999 Oil Consumption | 66.9%                 | 25.2%             | 5.5%                              | 2.5%                          | 100.0%       |
| Oil as a Percentage of the Sector (1999)                 | 96.9%                 | 26.8%             | 5.9%                              | 2.3%                          | 39.1%        |

Source: U.S. Department of Energy, Energy Information Administration (2001).

**Table 4-5b. Natural Gas Consumption by End-Use Sector**

| <b>End-Use Sector</b>                                | <b>Industrial</b> | <b>Residential and Commercial</b> | <b>Electricity Generation</b> | <b>Transportation</b> | <b>Total</b> |
|------------------------------------------------------|-------------------|-----------------------------------|-------------------------------|-----------------------|--------------|
| 1999 Consumption (quadrillion Btu)                   | 10.4              | 8.0                               | 3.2                           | .8                    | 22.3         |
| Sector As a Percentage of Total 1999 Gas Consumption | 46.5%             | 35.8%                             | 14.2%                         | 3.4%                  | 100.0%       |
| Gas As a Percentage of the Sector (1999)             | 29.1%             | 22.8%                             | 8.9%                          | 2.9%                  | 23.0%        |

Source: U.S. Department of Energy, Energy Information Administration (2001).

**Table 4-5a. Oil Consumption by End-Use Sector**

| <b>End-Use Sector</b>                                    | <b>Transportation</b> | <b>Industrial</b> | <b>Residential and Commercial</b> | <b>Electricity Generation</b> | <b>Total</b> |
|----------------------------------------------------------|-----------------------|-------------------|-----------------------------------|-------------------------------|--------------|
| 1999 Consumption (quadrillion Btu)                       | 25.4                  | 9.6               | 2.1                               | .9                            | 38.0         |
| The Sector as a Percentage of Total 1999 Oil Consumption | 66.9%                 | 25.2%             | 5.5%                              | 2.5%                          | 100.0%       |
| Oil as a Percentage of the Sector (1999)                 | 96.9%                 | 26.8%             | 5.9%                              | 2.3%                          | 39.1%        |

Source: U.S. Department of Energy, Energy Information Administration (2001).

**Table 4-5b. Natural Gas Consumption by End-Use Sector**

| <b>End-Use Sector</b>                                | <b>Industrial</b> | <b>Residential and Commercial</b> | <b>Electricity Generation</b> | <b>Transportation</b> | <b>Total</b> |
|------------------------------------------------------|-------------------|-----------------------------------|-------------------------------|-----------------------|--------------|
| 1999 Consumption (quadrillion Btu)                   | 10.4              | 8.0                               | 3.2                           | .8                    | 22.3         |
| Sector As a Percentage of Total 1999 Gas Consumption | 46.5%             | 35.8%                             | 14.2%                         | 3.4%                  | 100.0%       |
| Gas As a Percentage of the Sector (1999)             | 29.1%             | 22.8%                             | 8.9%                          | 2.9%                  | 23.0%        |

Source: U.S. Department of Energy, Energy Information Administration (2001).



**Table 4-5c. Most Likely Response to No Action (Alternative 5)**

| Sector                     | % of OCS Production |       | Quantity Involved |         |
|----------------------------|---------------------|-------|-------------------|---------|
|                            | Low                 | High  | Low               | High    |
| <b>Oil</b>                 |                     |       |                   |         |
| OCS Production (BBO)       | -100%               | -100% | -3.1              | -9.2    |
| Onshore Production (BBO)   | 3%                  | 3%    | 0.1               | 0.2     |
| Imports (BBO)              | 86%                 | 88%   | 2.7               | 8.1     |
| Conservation (BBOE)        | 7%                  | 6%    | 0.2               | 0.5     |
| Switch to Gas (BBOE)       | 5%                  | 4%    | 0.2               | 0.4     |
| <b>Gas</b>                 |                     |       |                   |         |
| OCS Production (TCFG)      | -100%               | -100% | -9.3              | -17.7   |
| Onshore Production (TCFG)  | 26%                 | 28%   | 2.4               | 4.9     |
| Imports (TCFG)             | 16%                 | 16%   | 1.4               | 2.8     |
| Conservation (TCFGE)       | 17%                 | 16%   | 1.6               | 2.9     |
| Switch to Oil (TCFGE/BBOE) | 42%                 | 40%   | 3.8/0.7           | 7.1/1.3 |
| Induced Oil Imports (BBO)  | NA                  | NA    | 0.6               | 1.1     |

BBO = billion barrels of oil

BBOE = the Btu equivalent of billion barrels of oil

TCFG = trillion cubic feet of natural gas

TCFGE = the Btu equivalent of trillion cubic feet of natural gas

**Table 4-5d. No Action (Alternative 5) – Oil-Spill Assumptions**

| Variables                                       | Gulf of Mexico           | Alaska                   | Pacific     |
|-------------------------------------------------|--------------------------|--------------------------|-------------|
| Total Imports (BBO)                             | 1.29 – 4.06 <sup>1</sup> | 0.12 – 0.22 <sup>2</sup> | 2.04 – 4.50 |
| # of Spills $\geq$ 1000 bbl <sup>3</sup>        | 1 Spill                  | No Spills                | 1 Spill     |
| Probability of 1 or More Spills $\geq$ 1000 bbl | 54 – 91%                 | 7 – 12%                  | 71 – 93%    |

<sup>1</sup> Energy markets will respond to the loss of OCS natural gas production under the no-action alternative by switching to an array of energy alternatives. The MMS MarketSim2000 model estimates that on an energy equivalent basis of 40–42% of the lost gas will be replaced by switching to oil. According to the model, about 86 percent of the additional oil demand will consist of additional oil imports. Additional imports will lead to potential additional oil spills. The import estimates for the Gulf of Mexico include imports resulting from switching from natural gas to oil under the no-action alternative.

<sup>2</sup> The oil replacing anticipated OCS production refined in Alaska would not be imported. It would be Alaska North Slope (ANS) oil tankered from Valdez to the refinery at Nikiski. Furthermore, on April 28, 1996, President Clinton signed an order permitting the export of ANS oil. Because this oil is required to remain at least 200 miles from the coast, it is not expected to have any negative environmental impacts outside the Prince William Sound area. The no-action alternative can be expected to diminish the oil available for export; however, this reduction in exports is not expected to make any significant change in oil spills or their environmental impacts.

<sup>3</sup> The import spills were estimated using half of the 0.72 spill/BBO rate for tankers in U.S. waters (based on 1985–1999 spill data). Spills associated with the first half of the import tanker trips are assumed to occur outside U.S. waters.

**Table 4-6a. Cumulative Case - Exploration and Development Scenario for the Gulf of Mexico Region**

| Scenario Elements                      | Gulf of Mexico Region |                 |                  |
|----------------------------------------|-----------------------|-----------------|------------------|
|                                        | Western               | Central         | Eastern          |
| Oil Production (BBO)                   | 3.35 – 5.53           | 12.01 – 16.53   | 0.139 – 0.37     |
| Gas Production (Tcf)                   | 42.66 – 58.17         | 108.27 – 146.27 | 1.406 – 2.456    |
| Years of Activity                      | 60                    | 60              | 50               |
| Platforms                              | 620 – 855             | 2,360 – 3,130   | 4 – 7            |
| Exploration and Delineation Wells      | 1,840 – 2,670         | 7,110 – 8,580   | 38 – 73          |
| Development and Production Wells       | 4,510 – 5,860         | 12,550 – 15,050 | 60 – 136         |
| Miles of Pipeline                      | 1,500 – 4,500         | 2,400 – 7,200   | 350 – 500        |
| Landfalls                              | 0 – 5                 | 0 – 5           | 2 – 4 (gas only) |
| Vessel Trips/Week                      | 930 – 1,280           | 3,540 – 4700    | 6 – 11           |
| Helicopter Trips/Week                  | 1,240 – 1,700         | 4,700 – 6,250   | 8 – 14           |
| New Shore Bases                        | 0 – 3                 | 0 – 1           | 1                |
| New Process Facilities                 | 0 – 1                 | 0 – 1           | 1                |
| New Waste Facilities                   | 4                     | 9               | 1                |
| Drill Muds/Well (bbl)                  |                       |                 |                  |
| Exploration/Delineation                | 7,860                 | 7,860           | 7,860            |
| Development/Production                 | 5,800                 | 5,800           | 5,800            |
| Drill Cuttings/ Well (bbl)             |                       |                 |                  |
| Exploration/Delineation                | 2,680                 | 2,680           | 2,680            |
| Development/Production                 | 1,630                 | 1,630           | 1,630            |
| Produced Water/Well (bbl)              |                       |                 |                  |
| Oil Well                               | 450                   | 450             | 450              |
| Gas Well                               | 68                    | 68              | 68               |
| Bottom Area Disturbed – Platforms (ha) | 500 – 680             | 1,890 – 2,500   | 8 – 14           |
| Bottom Area Disturbed – Pipeline (ha)  | 2,100 – 6,300         | 3,360 – 10,000  | 490 – 700        |
| Platform Removals with Explosives      | 500 – 680             | 1,890 – 2,500   | 1 – 2            |

**Table 4-6b. Cumulative Case - Exploration and Development Scenario for the Alaska Region**

| Scenario Elements                      | Alaska Region |             |                               |             |                               |
|----------------------------------------|---------------|-------------|-------------------------------|-------------|-------------------------------|
|                                        | Beaufort Sea  | Chukchi Sea | Hope Basin                    | Cook Inlet  | Norton Basin                  |
| Oil Production (BBO)                   | 1.89 – 3.22   | 0.96 – 2.42 | 0.010 – 0.020<br>(condensate) | 0.42 – 0.50 | 0.005 – 0.008<br>(condensate) |
| Gas Production (Tcf)                   | None          | None        | 0.290 – 0.714                 | 0.56 – 0.86 | 0.260 – 0.400                 |
| Years of Activity                      | 40            | 35          | 25                            | 35          | 20                            |
| Platforms                              | 15 – 25       | 2 – 8       | 2                             | 4 – 10      | 1                             |
| Exploration and Delineation Wells      | 40 – 60       | 6 – 24      | 6 – 10                        | 12 – 30     | 3 – 5                         |
| Development and Production Wells       | 350 – 600     | 106 – 320   | 8 – 18                        | 130 – 160   | 7 – 10                        |
| Miles of Onshore Pipeline              | 85 – 140      | 330         | 0                             | 75          | 0                             |
| Miles of Offshore Pipeline             | 160 – 215     | 100 – 260   | 50 – 100                      | 70 – 225    | 25 – 55                       |
| Landfalls                              | 2 – 4         | 1           | 1                             | 2 – 4       | 1                             |
| Vessel Trips/Week                      | 8 – 13        | 1 – 4       | 1                             | 4 – 10      | 1                             |
| Helicopter Trips/Week                  | 75 – 125      | 10 – 40     | 10                            | 20 – 50     | 5                             |
| New Shore Bases                        | 0             | 1           | 1                             | 0           | 1                             |
| New Process Facilities                 | 3 – 4         | 1           | 1                             | 0           | 1                             |
| New Waste Facilities                   | 0             | 1           | 1                             | 0           | 1                             |
| Drill Muds/Well (bbl)                  |               |             |                               |             |                               |
| Exploration/Delineation                | 255           | 565         | 350                           | 435         | 565                           |
| Development/Production                 | 290           | 320         | 200                           | 220         | 380                           |
| Drill Cuttings/Well (bbl)              |               |             |                               |             |                               |
| Exploration/Delineation                | 1,520         | 1,970       | 940                           | 1,275       | 1,970                         |
| Development/Production                 | 2,550         | 2,830       | 1,520                         | 1,600       | 3,335                         |
| Bottom Area Disturbed – Platforms (ha) | 45 – 75       | 6 – 24      | 6                             | 8 – 20      | 3                             |
| Bottom Area Disturbed – Pipelines (ha) | 120 – 160     | 75 – 195    | 40 – 75                       | 52 – 170    | 20 – 40                       |
| Platform Removals with Explosives      | 0             | 0           | 0                             | 0           | 0                             |

Assumptions

- All cuttings from exploration and delineation wells will be discharged at the offshore well site.
- All cuttings from production and development wells will be disposed of subsurface.
- 80% of drilling muds will be recycled.
- 20% of drilling muds for exploration and delineation wells will be discharged at the well site.
- All spent drill muds for production and development wells will be disposed of subsurface or at onshore waste disposal sites.
- All produced water will be reinjected.

**Table 4-6c. Cumulative Case – Oil-Spill Assumptions**

| Scenario Elements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Gulf of Mexico Region                                                                           |                                                                                                           |                          | Alaska Region                         |                                       |                  |                                        | Pacific Region                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------|---------------------------------------|------------------|----------------------------------------|---------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Western                                                                                         | Central                                                                                                   | Eastern                  | Beaufort Sea                          | Chukchi Sea                           | Cook Inlet       | Gulf of Alaska                         |                                                                                             |
| Oil Production (BBO)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3.35 – 5.53                                                                                     | 12.01 – 16.53                                                                                             | 0.139 – 0.37             | 1.89 – 3.22                           | 0.96 – 2.42                           | 0.42 – 0.50      | 0                                      | N/A                                                                                         |
| Years of Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 60                                                                                              | 60                                                                                                        | 50                       | 40                                    | 35                                    | 35               | N/A                                    | N/A                                                                                         |
| Large Oil Spills from OCS Activity*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1 Shallow Platform Spill<br>3 Shallow, 1 Deep Pipeline Spills<br>1 Deep, 1 Shallow Tanker Spill | 1 Shallow, 1 Deep Platform Spills<br>7 Shallow, 6 Deep Pipeline Spills<br>3 Shallow, 3 Deep Tanker Spills | 1 Shallow Pipeline Spill | 1 Platform Spill<br>2 Pipeline Spills | 1 Platform Spill<br>2 Pipeline Spills | 1 Pipeline Spill | 1 Tanker Spill (Arctic OCS production) | 2 Tanker Spills (Arctic OCS production)<br><br>1 Pipeline Spill (So. Calif. OCS production) |
| Prob. 1 + Spills ≥ 1,000 bbl (GOM)<br>≥ 500 bbl (AK)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | **                                                                                              | **                                                                                                        | 19 – 43%                 | 95 – 99%                              | up to 98%                             | 22 – 26%         | –                                      | –                                                                                           |
| Large Tanker Spills from AK and North Slope oil Production                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0                                                                                               | 0                                                                                                         | 0                        | 0                                     | 0                                     | 0                | 3                                      | 3                                                                                           |
| Large Oil Spills from Import Tankers*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15                                                                                              | 20                                                                                                        | 12                       | 0                                     | 0                                     | 0                | 0                                      | 5                                                                                           |
| Spills < 50 bbl<br>Mean No. Spills<br>Prob. 1+ Spills**                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 300 – 500<br>**                                                                                 | 1,100 – 1,500<br>**                                                                                       | 13 – 34<br>**            | 170 – 290<br>**                       | 85 – 220<br>**                        | 38 – 45<br>**    | –                                      | –                                                                                           |
| Spills 50 – 999 bbl<br>Mean No. Spills<br>Prob. 1+ Spills**                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 23 – 38<br>**                                                                                   | 80 – 115<br>**                                                                                            | 1 – 3<br>75-86%          | 13 – 22<br>**                         | 7 – 17<br>**                          | 3 – 4<br>94-97%  | –                                      | –                                                                                           |
| <p>* large spill sizes: pipeline: 4,600 bbl; platform: 1,500 bbl; tanker (GOM): 5,300 bbl; tanker (west coast): 7,800 bbl</p> <p>** Estimated probability greater than 99.5%</p> <p>OCS Spill Rates, Gulf of Mexico and offshore California spills, 1985-1999:</p> <p>Spills 1.1-49.9 bbl: 88.46 spills per Bbbl    6.1 bbl average size    3.0 bbl median size</p> <p>Spills 50-999 bbl: 6.72 spills per Bbbl    167.7 bbl average size    100.0 bbl median size</p> <p>Estimates of the probability of one or more spills occurring using Alaska rates are based on spill rates calculated on 1985-1998 data of 500 bbl and greater from Alaska Onshore North Slope facilities and pipelines the Trans-Alaska Pipeline System. Using these rates as a proxy for spills &gt;1,000 bbl is conservative, i.e., they should result in an overestimate of the number of spills of 1,000 barrels or greater since spill occurrence frequency varies inversely to spill size. Spill rates from ANS Crude tanker spills ≥ 1,000 bbl were also used for areas where the oil is assumed to be transported by tanker from Alaska to the U.S. west coast.</p> |                                                                                                 |                                                                                                           |                          |                                       |                                       |                  |                                        |                                                                                             |

**Table 4-7a. Estimated Greenhouse Gas Emission Rate From Proposed 2002-2007 OCS Program Activities (thousand metric tons of carbon equivalent per year)**

| <b>Area of Activity</b>             | <b>CO<sub>2</sub></b> | <b>CH<sub>4</sub></b> |
|-------------------------------------|-----------------------|-----------------------|
| Gulf of Mexico                      | 90 – 161              | 29 – 48               |
| Alaska                              | 204 – 456             | 0.6 – 1.3             |
| Tanker Transportation to West Coast | 46 – 105              | 63 – 144              |
| Total OCS Activities                | 340 – 722             | 93 – 193              |

**Table 4-7b. Estimated Greenhouse Gas Emission Rate From OCS Cumulative Program Activities (thousand metric tons of carbon equivalent per year)**

| <b>Area of Activity</b>             | <b>CO<sub>2</sub></b> | <b>CH<sub>4</sub></b> |
|-------------------------------------|-----------------------|-----------------------|
| Gulf of Mexico                      | 386 – 567             | 144 – 191             |
| Alaska                              | 381 – 723             | 1.1 – 2.1             |
| Tanker Transportation to West Coast | 75 – 134              | 103 – 184             |
| Pacific                             | 36                    | 10                    |
| Total OCS Activities                | 879 – 1,461           | 258 – 387             |

**Table 4-8a. Estimated Peak-Year Emissions for the Proposed 2002-2007 OCS Program, Western Gulf of Mexico Planning Area**

| Activity                   | Pollutant (tons/yr) |                 |                  |               |               |
|----------------------------|---------------------|-----------------|------------------|---------------|---------------|
|                            | NO <sub>x</sub>     | SO <sub>2</sub> | PM <sub>10</sub> | CO            | VOC           |
| Service Vessels            | 323 – 516           | 66 – 105        | 37 – 59          | 63 – 102      | 28 – 44       |
| Pipeline Vessels           | 221 – 735           | 31 – 102        | 9 – 30           | 74 – 246      | 20 – 67       |
| Helicopters                | 3 – 6               | 0.7 – 1         | 0.8 – 1          | 8 – 14        | 0.6 – 1       |
| Tanker and Barge Fugitives | 0                   | 0               | 0                | 0             | 219 – 430     |
| Tanker and Barge Exhaust   | 45 – 88             | 22 – 44         | 7 – 14           | 5 – 9         | 1 – 2         |
| Platform Construction      | 632 – 1,053         | 36 – 60         | 8 – 14           | 125 – 208     | 37 – 62       |
| Exploration Wells          | 258 – 773           | 30 – 90         | 7 – 22           | 69 – 206      | 25 – 74       |
| Production Wells           | 666 – 946           | 78 – 111        | 19 – 27          | 178 – 252     | 64 – 91       |
| Production Platforms       | 3,572 – 6,513       | 600 – 1094      | 65 – 119         | 831 – 1,516   | 2,708 – 4,938 |
| Total                      | 5,719 – 10,629      | 864 – 1,608     | 154 – 287        | 1,352 – 2,552 | 3,103 – 5,710 |

**Table 4-8b. Estimated Peak-Year Emissions for the Proposed 2002-2007 OCS Program, Central Gulf of Mexico Planning Area**

| Activity                   | Pollutant (tons/yr) |                 |                  |               |                |
|----------------------------|---------------------|-----------------|------------------|---------------|----------------|
|                            | NO <sub>x</sub>     | SO <sub>2</sub> | PM <sub>10</sub> | CO            | VOC            |
| Service Vessels            | 544 – 904           | 111 – 184       | 62 – 103         | 107 – 178     | 47 – 77        |
| Pipeline Vessels           | 272 – 882           | 38 – 123        | 11 – 36          | 91 – 296      | 25 – 81        |
| Helicopters                | 11 – 18             | 2 – 4           | 2 – 4            | 25 – 44       | 2 – 3          |
| Tanker and Barge Fugitives | 0                   | 0               | 0                | 0             | 469 – 1,023    |
| Tanker and Barge Exhaust   | 96 – 208            | 48 – 105        | 15 – 33          | 10 – 22       | 3 – 6          |
| Platform Construction      | 1,264 – 2,528       | 72 – 144        | 17 – 34          | 250 – 499     | 74 – 124       |
| Exploration Wells          | 634 – 1,368         | 74 – 160        | 18 – 39          | 169 – 364     | 61 – 132       |
| Production Wells           | 1,139 – 2,170       | 134 – 254       | 32 – 62          | 304 – 579     | 110 – 209      |
| Production Platforms       | 7,266 – 14,328      | 1,221 – 2,408   | 133 – 262        | 1,691 – 3,334 | 5,509 – 10,864 |
| Total                      | 11,224 – 22,407     | 1,700 – 1,495   | 291 – 574        | 2,646 – 5,315 | 6,299 – 12,519 |

**Table 4-8c. Estimated Peak-Year Emissions for the Proposed 2002-2007 OCS Program, Eastern Gulf of Mexico Planning Area**

| Activity                   | Pollutant (tons/yr) |                 |                  |           |           |
|----------------------------|---------------------|-----------------|------------------|-----------|-----------|
|                            | NO <sub>x</sub>     | SO <sub>2</sub> | PM <sub>10</sub> | CO        | VOC       |
| Service Vessels            | 30 – 42             | 6 – 9           | 3 – 5            | 6 – 8     | 3 – 4     |
| Pipeline Vessels           | 735 – 858           | 102 – 120       | 30 – 36          | 246 – 288 | 67 – 78   |
| Helicopters                | 0.2 – 0.3           | 0.0 – 0.1       | 0.0 – 0.1        | 0.4 – 0.6 | 0.0       |
| Tanker and Barge Fugitives | 0                   | 0               | 0                | 0         | 0         |
| Tanker and Barge Exhaust   | 0                   | 0               | 0                | 0         | 0         |
| Platform Construction      | 211                 | 12              | 3                | 42        | 12        |
| Exploration Wells          | 40                  | 5               | 1                | 11        | 4         |
| Production Wells           | 86 – 129            | 10 – 15         | 2 – 4            | 23 – 34   | 8 – 12    |
| Production Platforms       | 366 – 626           | 62 – 105        | 7 – 11           | 85 – 146  | 278 – 474 |
| Total                      | 1,468 – 1,907       | 197 – 265       | 47 – 60          | 413 – 529 | 372 – 585 |

**Table 4-8d. Estimated Typical Emissions for Activities Under the Proposed 2002-2007 OCS Program, Alaska Region**

| Activity                                                               | Pollutant (tons) |                 |                  |     |     |
|------------------------------------------------------------------------|------------------|-----------------|------------------|-----|-----|
|                                                                        | NO <sub>x</sub>  | SO <sub>2</sub> | PM <sub>10</sub> | CO  | VOC |
| Exploration Drilling <sup>1</sup> – Floating Drilling Vessel in Arctic | 2,312            | 83              | 75               | 264 | 120 |
| Exploration Drilling <sup>1</sup> – Bottom-Founded Vessel in Arctic    | 1,101            | 54              | 54               | 257 | 60  |
| Ice Island Construction in Arctic <sup>2</sup>                         | 821              | 66              | 58               | 184 | 64  |
| Platform Installation in Open Water <sup>2</sup>                       | 176              | 12              | 12               | 42  | 12  |
| Pipeline Construction <sup>3</sup>                                     | 9.3              | 0.8             | 0.7              | 2.1 | 0.7 |
| Production Well Drilling <sup>4</sup>                                  | 36               | 2.2             | 0.3              | 5.9 | 0.3 |
| Production Facility <sup>5</sup>                                       | 268              | 11              | 15               | 184 | 89  |

<sup>1</sup> Exploration drilling emissions are in terms of tons/well.

<sup>2</sup> Construction and installation emissions are in terms of tons/facility.

<sup>3</sup> Pipeline installation emissions are in terms of tons/mile.

<sup>4</sup> Production well drilling is in terms of tons/well.

<sup>5</sup> Production facility emissions are in terms of tons/year/facility.

**Table 4-9. Gulf of Mexico Proposed Action Employment and Income Projections<sup>1</sup>**

| <b>Area</b>                   | <b>Employment<sup>2</sup></b> | <b>Personal Income<sup>3</sup></b> |
|-------------------------------|-------------------------------|------------------------------------|
| Coastal Texas                 | 983,500 – 2,077,700           | \$43,561 – \$91,223                |
| Average year                  | 24,600 – 51,900               | \$1,089 – \$2,281                  |
| Coastal Louisiana             | 1,234,200 – 2,441,700         | \$45,913 – \$90,605                |
| Average year                  | 30,900 – 61,000               | \$1,148 – \$2,265                  |
| Coastal Mississippi & Alabama | 91,300 – 224,800              | \$2,874– \$7,039                   |
| Average year                  | 2,300 – 5,600                 | \$72 – \$176                       |
| Coastal Florida               | 9,800 – 18,000                | \$329 – \$601                      |
| Average year                  | 200 – 500                     | \$8 – \$15                         |
| Rest of Gulf of Mexico        | 442,800 – 937,900             | \$18,544 – \$38,942                |
| Average year                  | 11,100 – 23,400               | \$464 – \$974                      |
| Rest of United States         | 1,000,200 – 2,116,400         | \$39,729 – \$83,679                |
| Average year                  | 25,000 – 52,900               | \$993 – \$2,092                    |

<sup>1</sup> All estimates are totals of direct, indirect, and induced impacts. The first number in each cell is the low-moderate estimate and the second number is the high estimate. For each State, the first set of estimates is of the total coastal area impact over the life of the activity; the second set below is the average yearly impact.

<sup>2</sup> Employment estimates are in total or per year employee years.

<sup>3</sup> Personal income estimates are in millions of 1998 dollars.



**Table 4-10. Gulf of Mexico Proposed Action Sensitive Industry Projections**

|                                   | 2000       | 2005       | 2010       | 2015       | 2020       | % Change to 2020 | Proportion of Change |
|-----------------------------------|------------|------------|------------|------------|------------|------------------|----------------------|
| <b>Coastal Labor Markets</b>      |            |            |            |            |            |                  |                      |
| All-Industry Total                | 10,883,000 | 11,682,000 | 12,324,000 | 12,729,000 | 13,012,000 | 20               | 100%                 |
| Ag. Services, Forestry, Fisheries | 184,000    | 206,000    | 224,000    | 235,000    | 246,000    | 33               | 3%                   |
| Coastal Tourism/Travel            | 1,653,000  | 1,772,000  | 1,868,000  | 1,929,000  | 1,972,000  | 19               | 15%                  |
| Impact Sensitive Employment       | 1,837,000  | 1,978,000  | 2,092,000  | 2,165,000  | 2,218,000  | 21               | 18%                  |
| Percent Impact Sensitive          | 17         | 17         | 17         | 17         | 17         |                  |                      |
| <b>Western Planning Area</b>      |            |            |            |            |            |                  |                      |
| All-Industry Total                | 3,708,000  | 4,012,000  | 4,288,000  | 4,499,000  | 4,696,000  | 27               | 100%                 |
| Ag. Services, Forestry, Fisheries | 54,000     | 62,000     | 69,000     | 74,000     | 79,000     | 46               | 3%                   |
| Coastal Tourism/Travel            | 582,000    | 628,000    | 671,000    | 703,000    | 733,000    | 26               | 15%                  |
| Impact Sensitive Employment       | 636,000    | 690,000    | 740,000    | 777,000    | 813,000    | 28               | 18%                  |
| Percent Impact Sensitive          | 17         | 17         | 17         | 17         | 17         |                  |                      |
| <b>Central Planning Area</b>      |            |            |            |            |            |                  |                      |
| All-Industry Total                | 2,353,000  | 2,448,000  | 2,521,000  | 2,556,000  | 2,573,000  | 9                | 100%                 |
| Ag. Services, Forestry, Fisheries | 39,000     | 42,000     | 45,000     | 46,000     | 48,000     | 25               | 4%                   |
| Coastal Tourism/Travel            | 380,000    | 396,000    | 408,000    | 414,000    | 417,000    | 10               | 16%                  |
| Impact Sensitive Employment       | 419,000    | 438,000    | 453,000    | 460,000    | 465,000    | 11               | 21%                  |
| Percent Impact Sensitive          | 18         | 18         | 18         | 18         | 18         |                  |                      |
| <b>Eastern Planning Area</b>      |            |            |            |            |            |                  |                      |
| All-Industry Total                | 4,823,000  | 5,221,000  | 5,515,000  | 5,674,000  | 5,743,000  | 19               | 100%                 |
| Ag. Services, Forestry, Fisheries | 92,000     | 103,000    | 110,000    | 115,000    | 118,000    | 29               | 3%                   |
| Coastal Tourism/Travel            | 690,600    | 748,000    | 790,000    | 813,000    | 822,000    | 19               | 14%                  |
| Impact Sensitive Employment       | 782,000    | 850,000    | 900,000    | 928,000    | 941,000    | 20               | 17%                  |
| Percent Impact Sensitive          | 16         | 16         | 16         | 16         | 16         |                  |                      |
| <b>Mobile</b>                     |            |            |            |            |            |                  |                      |
| All-Industry Total                | 319,000    | 339,000    | 355,000    | 363,000    | 367,000    | 15               | 100%                 |
| Ag. Services, Forestry, Fisheries | 8,000      | 8,000      | 9,000      | 9,000      | 10,000     | 22               | 4%                   |
| Coastal Tourism/Travel            | 52,000     | 56,000     | 58,000     | 60,000     | 60,000     | 15               | 16%                  |
| Impact Sensitive Employment       | 60,000     | 64,000     | 67,000     | 69,000     | 70,000     | 16               | 20%                  |
| Percent Impact Sensitive          | 19         | 19         | 19         | 19         | 19         |                  |                      |

**Table 4-10. Gulf of Mexico Proposed Action Sensitive Industry Projections (continued)**

|                                   | 2000    | 2005    | 2010    | 2015    | 2020    | % Change to 2020 | Proportion of Change |
|-----------------------------------|---------|---------|---------|---------|---------|------------------|----------------------|
| <b>Biloxi-Gulfport</b>            |         |         |         |         |         |                  |                      |
| All-Industry Total                | 256,000 | 276,000 | 292,000 | 302,000 | 307,000 | 0                | 100%                 |
| Ag. Services, Forestry, Fisheries | 10,000  | 11,000  | 12,000  | 12,000  | 13,000  | 27               | 7%                   |
| Coastal Tourism/Travel            | 39,000  | 42,000  | 45,000  | 46,000  | 47,000  | 20               | 21%                  |
| Impact Sensitive Employment       | 49,000  | 53,000  | 56,000  | 58,000  | 60,000  | 21               | 28%                  |
| Percent Impact Sensitive          | 19      | 19      | 19      | 19      | 19      |                  |                      |
| <b>New Orleans</b>                |         |         |         |         |         |                  |                      |
| All-Industry Total                | 736,000 | 755,000 | 768,000 | 773,000 | 774,000 | 5                | 100%                 |
| Ag. Services, Forestry, Fisheries | 10,000  | 11,000  | 12,000  | 12,000  | 13,000  | 27               | 7%                   |
| Coastal Tourism/Travel            | 97,000  | 100,000 | 101,000 | 102,000 | 102,000 | 5                | 13%                  |
| Impact Sensitive Employment       | 107,000 | 111,000 | 113,000 | 114,000 | 115,000 | 7                | 20%                  |
| Percent Impact Sensitive          | 15      | 15      | 15      | 15      | 15      |                  |                      |
| <b>Baton Rouge</b>                |         |         |         |         |         |                  |                      |
| All-Industry Total                | 432,000 | 449,000 | 464,000 | 471,000 | 475,000 | 10               | 100%                 |
| Ag. Services, Forestry, Fisheries | 3,000   | 4,000   | 4,000   | 4,000   | 4,000   | 32               | 3%                   |
| Coastal Tourism/Travel            | 78,000  | 82,000  | 84,000  | 86,000  | 86,000  | 10               | 18%                  |
| Impact Sensitive Employment       | 82,000  | 85,000  | 88,000  | 90,000  | 91,000  | 11               | 21%                  |
| Percent Impact Sensitive          | 19      | 19      | 19      | 19      | 19      |                  |                      |
| <b>Lafayette</b>                  |         |         |         |         |         |                  |                      |
| All-Industry Total                | 283,000 | 295,000 | 303,000 | 307,000 | 309,000 | 9                | 100%                 |
| Ag. Services, Forestry, Fisheries | 3,000   | 4,000   | 4,000   | 4,000   | 4,000   | 19               | 2%                   |
| Coastal Tourism/Travel            | 55,000  | 57,000  | 59,000  | 60,000  | 60,000  | 9                | 20%                  |
| Impact Sensitive Employment       | 59,000  | 61,000  | 63,000  | 64,000  | 64,000  | 10               | 22%                  |
| Percent Impact Sensitive          | 21      | 21      | 21      | 21      | 21      |                  |                      |
| <b>Lake Charles</b>               |         |         |         |         |         |                  |                      |
| All-Industry Total                | 180,000 | 186,000 | 190,000 | 191,000 | 192,000 | 6                | 100%                 |
| Ag. Services, Forestry, Fisheries | 2,000   | 2,000   | 2,000   | 2,000   | 2,000   | 23               | 4%                   |
| Coastal Tourism/Travel            | 32,000  | 33,000  | 34,000  | 34,000  | 34,000  | 6                | 18%                  |
| Impact Sensitive Employment       | 34,000  | 35,000  | 36,000  | 36,000  | 37,000  | 7                | 22%                  |
| Percent Impact Sensitive          | 19      | 19      | 19      | 19      | 19      |                  |                      |

**Table 4-10. Gulf of Mexico Proposed Action Sensitive Industry Projections (continued)**

|                                   | 2000      | 2005      | 2010      | 2015      | 2020      | % Change to 2020 | Proportion of Change |
|-----------------------------------|-----------|-----------|-----------|-----------|-----------|------------------|----------------------|
| <b>Houma</b>                      |           |           |           |           |           |                  |                      |
| All-Industry Total                | 144,000   | 148,000   | 149,000   | 149,000   | 149,000   | 3                | 100%                 |
| Ag. Services, Forestry, Fisheries | 2,000     | 2,000     | 2,000     | 2,000     | 2,000     | 23               | 10%                  |
| Coastal Tourism/Travel            | 26,000    | 26,000    | 27,000    | 27,000    | 27,000    | 3                | 18%                  |
| Impact Sensitive Employment       | 28,000    | 29,000    | 29,000    | 29,000    | 29,000    | 5                | 28%                  |
| Percent Impact Sensitive          | 19        | 19        | 19        | 19        | 20        |                  |                      |
| <b>Beaumont-Port Arthur</b>       |           |           |           |           |           |                  |                      |
| All-Industry Total                | 263,000   | 285,000   | 304,000   | 320,000   | 335,000   | 27               | 100%                 |
| Ag. Services, Forestry, Fisheries | 4,000     | 4,000     | 5,000     | 5,000     | 6,000     | 61               | 3%                   |
| Coastal Tourism/Travel            | 38,000    | 41,000    | 44,000    | 46,000    | 49,000    | 27               | 15%                  |
| Impact Sensitive Employment       | 42,000    | 45,000    | 49,000    | 51,000    | 54,000    | 30               | 17%                  |
| Percent Impact Sensitive          | 16        | 16        | 16        | 16        | 16        |                  |                      |
| <b>Houston-Galveston</b>          |           |           |           |           |           |                  |                      |
| All-Industry Total                | 2,401,000 | 2,585,000 | 2,747,000 | 2,871,000 | 2,984,000 | 24               | 100%                 |
| Ag. Services, Forestry, Fisheries | 27,000    | 32,000    | 35,000    | 38,000    | 42,000    | 51               | 2%                   |
| Coastal Tourism/Travel            | 380,000   | 409,000   | 435,000   | 454,000   | 472,000   | 24               | 16%                  |
| Impact Sensitive Employment       | 408,000   | 441,000   | 470,000   | 493,000   | 514,000   | 26               | 18%                  |
| Percent Impact Sensitive          | 17        | 17        | 17        | 17        | 17        |                  |                      |
| <b>Corpus Christi</b>             |           |           |           |           |           |                  |                      |
| All-Industry Total                | 275,000   | 291,000   | 306,000   | 317,000   | 327,000   | 19               | 100%                 |
| Ag. Services, Forestry, Fisheries | 5,000     | 5,000     | 6,000     | 6,000     | 7,000     | 47               | 4%                   |
| Coastal Tourism/Travel            | 52,000    | 55,000    | 58,000    | 60,000    | 62,000    | 19               | 19%                  |
| Impact Sensitive Employment       | 56,000    | 60,000    | 63,000    | 66,000    | 68,000    | 21               | 23%                  |
| Percent Impact Sensitive          | 21        | 21        | 21        | 21        | 21        |                  |                      |
| <b>Brownsville-McAllen</b>        |           |           |           |           |           |                  |                      |
| All-Industry Total                | 516,000   | 583,000   | 648,000   | 698,000   | 746,000   | 45               | 100%                 |
| Ag. Services, Forestry, Fisheries | 15,000    | 17,000    | 19,000    | 20,000    | 20,000    | 34               | 2%                   |
| Coastal Tourism/Travel            | 68,000    | 77,000    | 85,000    | 92,000    | 98,000    | 45               | 13%                  |
| Impact Sensitive Employment       | 83,000    | 94,000    | 104,000   | 111,000   | 118,000   | 43               | 15%                  |
| Percent Impact Sensitive          | 16        | 16        | 16        | 16        | 16        |                  |                      |

**Table 4-10. Gulf of Mexico Proposed Action Sensitive Industry Projections (continued)**

|                                   | 2000    | 2005    | 2010    | 2015    | 2020    | % Change to 2020 | Proportion of Change |
|-----------------------------------|---------|---------|---------|---------|---------|------------------|----------------------|
| <b>Victoria</b>                   |         |         |         |         |         |                  |                      |
| All-Industry Total                | 84,000  | 88,000  | 92,000  | 95,000  | 98,000  | 17               | 100%                 |
| Ag. Services, Forestry, Fisheries | 1,000   | 1,000   | 2,000   | 2,000   | 2,000   | 43               | 5%                   |
| Coastal Tourism/Travel            | 14,000  | 15,000  | 16,000  | 16,000  | 16,000  | 17               | 17%                  |
| Impact Sensitive Employment       | 16,000  | 17,000  | 17,000  | 18,000  | 19,000  | 19               | 21%                  |
| Percent Impact Sensitive          | 19      | 19      | 19      | 19      | 19      |                  |                      |
| <b>Brazoria</b>                   |         |         |         |         |         |                  |                      |
| All-Industry Total                | 169,000 | 180,000 | 191,000 | 200,000 | 206,000 | 22               | 100%                 |
| Ag. Services, Forestry, Fisheries | 2,000   | 2,000   | 2,000   | 3,000   | 3,000   | 49               | 3%                   |
| Coastal Tourism/Travel            | 30,000  | 32,000  | 34,000  | 35,000  | 36,000  | 22               | 18%                  |
| Impact Sensitive Employment       | 32,000  | 34,000  | 36,000  | 38,000  | 39,000  | 24               | 20%                  |
| Percent Impact Sensitive          | 19      | 19      | 19      | 19      | 19      |                  |                      |
| <b>Pensacola</b>                  |         |         |         |         |         |                  |                      |
| All-Industry Total                | 347,000 | 384,000 | 412,000 | 429,000 | 440,000 | 27               | 100%                 |
| Ag. Services, Forestry, Fisheries | 4,000   | 5,000   | 5,000   | 6,000   | 6,000   | 53               | 2%                   |
| Coastal Tourism/Travel            | 52,000  | 58,000  | 62,000  | 64,000  | 66,000  | 27               | 15%                  |
| Impact Sensitive Employment       | 56,000  | 62,000  | 67,000  | 70,000  | 72,000  | 29               | 17%                  |
| Percent Impact Sensitive          | 16      | 16      | 16      | 16      | 16      |                  |                      |
| <b>Panama City</b>                |         |         |         |         |         |                  |                      |
| All-Industry Total                | 99,000  | 109,000 | 116,000 | 121,000 | 124,000 | 26               | 100%                 |
| Ag. Services, Forestry, Fisheries | 2,000   | 2,000   | 2,000   | 3,000   | 3,000   | 49               | 4%                   |
| Coastal Tourism/Travel            | 15,000  | 16,000  | 17,000  | 18,000  | 19,000  | 26               | 15%                  |
| Impact Sensitive Employment       | 17,000  | 18,000  | 19,847  | 21,000  | 21,000  | 28               | 19%                  |
| Percent Impact Sensitive          | 17      | 17      | 17      | 17      | 17      |                  |                      |
| <b>Tallahassee</b>                |         |         |         |         |         |                  |                      |
| All-Industry Total                | 232,000 | 253,000 | 268,000 | 276,000 | 281,000 | 21               | 100%                 |
| Ag. Services, Forestry, Fisheries | 4,000   | 5,000   | 6,000   | 6,000   | 6,000   | 43               | 4%                   |
| Coastal Tourism/Travel            | 48,000  | 52,000  | 55,000  | 57,000  | 58,000  | 21               | 21%                  |
| Impact Sensitive Employment       | 52,000  | 57,000  | 61,000  | 63,000  | 64,000  | 23               | 25%                  |
| Percent Impact Sensitive          | 23      | 23      | 23      | 23      | 23      |                  |                      |

**Table 4-10. Gulf of Mexico Proposed Action Sensitive Industry Projections (continued)**

|                                   | 2000      | 2005      | 2010      | 2015      | 2020      | % Change to 2020 | Proportion of Change |
|-----------------------------------|-----------|-----------|-----------|-----------|-----------|------------------|----------------------|
| <b>Lake City</b>                  |           |           |           |           |           |                  |                      |
| All-Industry Total                | 76,000    | 84,000    | 90,000    | 94,000    | 96,000    | 25               | 100%                 |
| Ag. Services, Forestry, Fisheries | 1,000     | 1,000     | 1,000     | 1,000     | 1,000     | 38               | 2%                   |
| Coastal Tourism/Travel            | 9,000     | 10,000    | 11,000    | 12,000    | 12,000    | 25               | 12%                  |
| Impact Sensitive Employment       | 10,000    | 12,000    | 12,000    | 13,000    | 13,000    | 27               | 14%                  |
| Percent Impact Sensitive          | 134       | 14        | 14        | 14        | 14        |                  |                      |
| <b>Gainesville</b>                |           |           |           |           |           |                  |                      |
| All-Industry Total                | 183,000   | 200,000   | 214,000   | 221,000   | 226,000   | 24               | 100%                 |
| Ag. Services, Forestry, Fisheries | 2,000     | 3,000     | 3,000     | 3,000     | 3,000     | 36               | 2%                   |
| Coastal Tourism/Travel            | 20,000    | 22,000    | 24,000    | 24,000    | 25,000    | 24               | 11%                  |
| Impact Sensitive Employment       | 23,000    | 25,000    | 26,000    | 27,000    | 28,000    | 25               | 13%                  |
| Percent Impact Sensitive          | 12        | 12        | 12        | 12        | 12        |                  |                      |
| <b>Ocala</b>                      |           |           |           |           |           |                  |                      |
| All-Industry Total                | 180,000   | 203,000   | 222,000   | 234,000   | 241,000   | 34               | 100%                 |
| Ag. Services, Forestry, Fisheries | 4,000     | 4,000     | 5,000     | 5,000     | 5,000     | 27               | 2%                   |
| Coastal Tourism/Travel            | 27,000    | 30,000    | 33,000    | 35,000    | 36,000    | 34               | 15%                  |
| Impact Sensitive Employment       | 31,000    | 35,000    | 38,000    | 40,000    | 41,000    | 33               | 17%                  |
| Percent Impact Sensitive          | 17        | 17        | 17        | 17        | 17        |                  |                      |
| <b>Tampa</b>                      |           |           |           |           |           |                  |                      |
| All-Industry Total                | 1,126,000 | 1,200,000 | 1,251,000 | 1,274,000 | 1,278,000 | 13               | 100%                 |
| Ag. Services, Forestry, Fisheries | 15,000    | 16,000    | 17,000    | 17,000    | 17,000    | 18               | 2%                   |
| Coastal Tourism/Travel            | 163,000   | 174,000   | 181,000   | 185,000   | 185,000   | 13               | 15%                  |
| Impact Sensitive Employment       | 178,000   | 190,000   | 198,000   | 202,000   | 202,000   | 14               | 16%                  |
| Percent Impact Sensitive          | 16        | 16        | 16        | 16        | 16        |                  |                      |
| <b>Sarasota</b>                   |           |           |           |           |           |                  |                      |
| All-Industry Total                | 331,000   | 361,000   | 385,000   | 398,000   | 403,000   | 22               | 100%                 |
| Ag. Services, Forestry, Fisheries | 7,000     | 8,000     | 9,000     | 9,000     | 9,000     | 27               | 3%                   |
| Coastal Tourism/Travel            | 43,000    | 47,000    | 50,000    | 51,000    | 52,000    | 22               | 13%                  |
| Impact Sensitive Employment       | 50,000    | 55,000    | 58,000    | 60,000    | 61,000    | 23               | 16%                  |
| Percent Impact Sensitive          | 15        | 15        | 15        | 15        | 15        |                  |                      |

**Table 4-10. Gulf of Mexico Proposed Action Sensitive Industry Projections (continued)**

|                                   | 2000      | 2005      | 2010      | 2015      | 2020      | % Change to 2020 | Proportion of Change |
|-----------------------------------|-----------|-----------|-----------|-----------|-----------|------------------|----------------------|
| <b>Naples</b>                     |           |           |           |           |           |                  |                      |
| All-Industry Total                | 308,000   | 344,000   | 374,000   | 392,000   | 403,000   | 31               | 100%                 |
| Ag. Services, Forestry, Fisheries | 9,000     | 10,000    | 11,000    | 11,000    | 11,000    | 20               | 2%                   |
| Coastal Tourism/Travel            | 44,000    | 49,000    | 53,000    | 55,000    | 57,000    | 31               | 14%                  |
| Impact Sensitive Employment       | 53,000    | 59,000    | 63,000    | 66,000    | 68,000    | 29               | 16%                  |
| Percent Impact Sensitive          | 17        | 17        | 17        | 17        | 17        |                  |                      |
| <b>Miami</b>                      |           |           |           |           |           |                  |                      |
| All-Industry Total                | 1,940,000 | 2,082,000 | 2,184,000 | 2,235,000 | 2,250,000 | 16               | 100%                 |
| Ag. Services, Forestry, Fisheries | 44,000    | 49,000    | 53,000    | 55,000    | 57,000    | 30               | 4%                   |
| Coastal Tourism/Travel            | 269,000   | 289,000   | 303,000   | 310,000   | 313,000   | 16               | 14%                  |
| Impact Sensitive Employment       | 313,000   | 338,000   | 356,000   | 365,000   | 369,000   | 18               | 18%                  |
| Percent Impact Sensitive          | 16        | 16        | 16        | 16        | 16        |                  |                      |

**Table 4-11. Alaska Proposed Action Employment and Income Projections<sup>1</sup>**

| <b>Area</b>               | <b>Employment<sup>2</sup></b> | <b>Personal Income<sup>3</sup></b> |
|---------------------------|-------------------------------|------------------------------------|
| Beaufort (NSB)            | 2,600 – 4,200                 | \$116 – \$187                      |
| Average year              | 90 – 140                      | \$4 – \$6                          |
| Chukchi/Hope (NSB/NWAB)   | 3,800 – 7,900                 | \$166– \$346                       |
| Average year              | 120 – 250                     | \$5 – \$11                         |
| Cook Inlet (KPB)          | 4,400 – 6,900                 | \$112 – \$175                      |
| Average year              | 100 – 200                     | \$ – \$5                           |
| Norton (Local Area & KPB) | 1,100 – 1,200                 | \$27 – \$31                        |
| Average year              | 60 – 60                       | \$1 – \$2                          |
| Rest of Alaska            | 105,900 – 210,700             | \$3,153 – \$6,386                  |
| Average year              | 3,400 – 6,800                 | \$101 – \$207                      |
| Rest of United States     | 118,500 – 217,800             | \$4,236 – \$7,790                  |
| Average year              | 4,000 – 7,200                 | \$141 – \$256                      |

<sup>1</sup> All estimates are totals of direct, indirect, and induced impacts. The first number in each cell is the low-moderate estimate, and the second number is the high estimate. For each planning area, the first set of estimates is of the total local impact over the life of the activity; the second set below is the average yearly local impact.

<sup>2</sup> Employment estimates are in total or per year employee years.

<sup>3</sup> Personal income estimates are in millions of 1998 dollars.

**Table 4-12. Estimated Average Emissions for the Cumulative OCS Program, Gulf of Mexico Region**

| Activity                   | Pollutant (tons/yr) |                 |                  |                 |                 |
|----------------------------|---------------------|-----------------|------------------|-----------------|-----------------|
|                            | NO <sub>x</sub>     | SO <sub>2</sub> | PM <sub>10</sub> | CO              | VOC             |
| Service Vessels            | 10,167 – 13,743     | 2,070 – 2,798   | 1,155 – 1,561    | 2,001 – 2,705   | 871 – 1,177     |
| Pipeline Vessels           | 521 – 1,495         | 73 – 208        | 22 – 62          | 175 – 501       | 48 – 137        |
| Helicopters                | 142 – 190           | 28 – 38         | 32 – 43          | 336 – 450       | 24 – 33         |
| Tanker and Barge Fugitives | 0                   | 0               | 0                | 0               | 1,767 – 2,557   |
| Tanker and Barge Exhaust   | 360 – 521           | 181 – 262       | 57 – 83          | 37 – 54         | 10 – 15         |
| Platform Construction      | 10,475 – 14,042     | 596 – 799       | 140 – 188        | 2,069 – 2,773   | 615 – 824       |
| Exploration Wells          | 2,969 – 3,740       | 328 – 414       | 82 – 103         | 791 – 996       | 274 – 345       |
| Production Wells           | 6,127 – 7,538       | 689 – 847       | 167 – 205        | 1,568 – 1,927   | 566 – 696       |
| Production Platforms       | 52,661 – 71,741     | 8,849 – 12,056  | 963 – 1,311      | 12,254 – 16,694 | 39,930 – 54,398 |
| Total                      | 83,422 – 113,009    | 12,816 – 17,423 | 2,618 – 3,556    | 19,231 – 26,101 | 44,105 – 60,181 |