

II. ALTERNATIVES INCLUDING THE PROPOSED ACTION

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This environmental impact statement (EIS) analyzes ten alternatives for the scheduling of Outer Continental Shelf (OCS) lease sales by the U.S. Department of the Interior (USDOI), Minerals Management Service (MMS) for the period from mid-2007 to mid-2012. These alternatives are:

- Alternative 1—Proposed Action
- Alternative 2—Exclude North Aleutian Basin
- Alternative 3—Exclude Cook Inlet
- Alternative 4—Exclude Mid-Atlantic
- Alternative 5—Defer Blocks Within 25 Miles of Virginia and Chukchi Sea Coasts
- Alternative 6—Defer Blocks at the Mouth of the Chesapeake Bay
- Alternative 7—Limit Leasing in the North Aleutian Basin Planning Area to Blocks Offered in Lease Sale 92
- Alternative 8—Defer Blocks in the Beaufort Sea Planning Area to Avoid Conflicts with Whaling
- Alternative 9—Defer Blocks Within 50 Miles of Virginia with Possible Other Restrictions
- Alternative 10—No Action

Alternatives 8 and 9 are new alternatives that were not included in the draft EIS (DEIS). They were developed as a result of public comment on the DEIS, and information provided to MMS during the consultation process with affected States after the DEIS was published.

This chapter describes each alternative and summarizes the potential environmental impacts of the alternatives in comparative form. The summary describes the primary impacts based on the more detailed analysis of all potential impacts presented in Chapter IV. The EIS's impact analyses were generated from exploration, development, transportation, and oil-spill scenarios developed specifically for analytical purposes.

A. Alternative 1—Proposed Action

1. Description

The four Outer Continental Shelf (OCS) Regions are divided into 26 OCS planning areas (Fig. II-1). The USDOI is considering leasing in three OCS areas, Gulf of Mexico, Alaska, and mid-Atlantic. No leasing will occur in the Pacific Region during the 2007-2012 program. Within the Gulf of Mexico OCS Region, leasing is being considered in the Central and Western Gulf of Mexico Planning Areas. In the Mid-Atlantic Planning Area, leasing is being considered offshore Virginia. In addition, the USDOI is considering leasing in 4 of the 14 Alaska Region planning areas: Beaufort Sea, Chukchi Sea, Cook Inlet, and North Aleutian Basin. All other planning areas are not analyzed in this EIS because the USDOI is not considering those areas for leasing in the proposed 5-year program.

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Alternative 1—the Proposed Action calls for 20 sales:

- Central Gulf of Mexico—6 areawide lease sales (Fig. II-2)
- Western Gulf of Mexico—5 annual areawide lease sales (Fig. II-2)
- Beaufort Sea—2 lease sales scheduled in 2009 and 2011 (Fig. II-3)
- Chukchi Sea—3 lease sales scheduled in 2007, 2010, and 2012 (Fig. II-3)
- North Aleutian Basin – 1 sale scheduled in 2011 (Fig. II-4)
- Cook Inlet—2 lease sales scheduled in 2009 and 2011 (Fig. II-5)
- Mid-Atlantic – 1 sale in 2011, which is subject to restrictions (Fig. II-6)

Activities that could occur as a result of the 20 lease sales in the proposal may extend over a period of 25-40 years. The impact-causing factors associated with these activities include the placement of offshore infrastructure such as rigs, platforms, and pipelines, and onshore facilities such as support bases and processing plants. Operational impacts include bottom disturbance from platform and pipeline placement; local water quality changes from discharging drilling fluids; and air and noise emissions from platforms, supply boats, and air traffic. The specific estimates of offshore infrastructure required to support exploration and development of the hydrocarbon resources (scenarios) associated with alternative 1 (the proposed action) are provided in Tables IV-1 through IV-3.

Chapter IV presents the basic assumptions about anticipated production, exploration, development, transportation, and oil-spills used to prepare the EIS. Transportation for most oil and gas from the Western and Central Gulf of Mexico Planning Areas would be accomplished by extending and expanding the existing offshore pipeline systems. Some of the oil in deepwater areas and a small amount of the oil from the nearshore areas of the Western and Central Gulf of Mexico Planning Areas would be transported by barge or shuttle tanker.

In the Alaska OCS Region, the lifting of the export ban on Alaskan crude oil has led to infrequent and limited shipments to East Asia. However, the vast majority of oil transported via the Trans-Alaska Pipeline System (TAPS) is still being sent to the U.S. west coast. Oil from the Beaufort Sea and Chukchi Sea Planning Areas would be transported by new subsea and overland pipelines to the TAPS and would eventually be carried to the marine terminal facilities in Valdez where it would be loaded on tankers and shipped primarily to west coast ports. Oil from the Cook Inlet Planning Area would be transported to shore using new subsea pipelines, with new onshore common-carrier pipeline systems delivering the oil to existing refineries in Nikiski and gas to transmission facilities in the Kenai area. In the North Aleutian Basin oil, condensate, and gas will be transported to shore. The gas will be converted to liquefied natural gas and shipped to other markets.

Oil spills are the principal accidental impact-causing event. Table IV-4 presents the number of oil spills assumed to occur as a result of the production and transportation of oil associated with lease sales proposed in alternative 1. The sizes of the assumed large spills are approximately equal to the mean of the historical spills for each spill type (platform, pipeline, tanker, or barge). The assumed spill sizes are: platforms—1,500 barrels (bbl); pipelines—4,600 bbl; and tankers—5,300 bbl for the Gulf of Mexico, and 7,800 bbl for tankers carrying Alaska OCS oil. Assumptions regarding the location of spills are based on the source of the spill, the transportation and market assumptions, the location of existing infrastructure, and the location of the resources being analyzed. Platform spills were assumed to occur in the area proposed for consideration for lease. Pipeline spills were assumed to occur between the proposed area for lease consideration and the existing infrastructure. Tanker and barge spills were assumed to occur along the tanker and barge routes.

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On January 7, 2007, the U.S. Fish and Wildlife Service (FWS) published a proposed rule (72 FR 1064) to list polar bear under the Endangered Species Act (ESA) as threatened throughout its range (FWS: <http://alaska.fws.gov/fisheries/mmm/polarbear/issues.htm>). Given this proposed listing, the MMS will work in close coordination with the FWS as listing occurs to further review and identify the specific oil and gas activities that are likely to affect polar bears and to identify mitigation and monitoring measures that seek to reduce the potential for impacts to occur.

Finally, the EIS analyses assume the implementation of all mitigation measures required by statute, regulation, and standard lease stipulation. The protection afforded by these measures is present in the analysis of the resource being mitigated. All MMS sale proposals include rules and regulations prescribing environmental controls applicable to lease operators. Lease stipulations, OCS regulations, and other measures provide a regulatory base for implementing environmental protection on leases issued as a result of a sale. The MMS Environmental Studies Program and the analyses and monitoring of activities in a sale area provide information used in formulating the Agency's regulatory control over the activities that occur during the life of the leases. The EIS also assumes that MMS will continue to use its broad permitting and monitoring and enforcement authority to ensure safe operations and environmental protection, including use of the best available and safest technologies and requiring existing mitigations. The EIS assumes that MMS will continue to monitor operations after drilling has begun and carry out periodic inspections of facilities (in certain instances, in conjunction with other Federal Agencies such as the U.S. Environmental Protection Agency [USEPA]) to ensure safe and clean operations over the life of the leases.

2. Summary of Impacts

a. Impacts on Air Quality

The most commonly emitted air pollutants associated with OCS oil and gas activities include nitrogen dioxide (NO_x), sulfur dioxide (SO_x), particulate matter less than 10 microns in diameter (PM₁₀), particulate matter less than 2.5 microns in diameter (PM_{2.5}), carbon monoxide (CO), and volatile organic compounds (VOC). The most common NO_x sources associated with OCS activities are diesel engines used in construction, drilling and support activities; gas reciprocating engines; turbines; and support vessels. Ozone (O₃) may form in the atmosphere when NO_x emissions combine with VOC under the influence of sunlight and warm temperatures. The USEPA has established national ambient air quality standards (NAAQS) for these pollutants and O₃. The USEPA standards will not be exceeded as a result of routine OCS activities. Air quality impacts from oil spills and in-situ burning would be localized and of short duration.

Emissions from the 2007-2012 program activities on the Gulf of Mexico OCS would cause some slight, localized increases in concentrations of NO₂, SO₂, PM₁₀, PM_{2.5}, and CO in the Gulf coastal areas. Concentrations would be well within the NAAQS and the Prevention of Significant Deterioration (PSD) increments. Portions of the Texas and Louisiana are classified nonattainment for O₃. Emissions from the Proposed 5-Year Program would contribute only very slightly, if at all, toward exceeding the O₃ standard in those areas.

Emissions from 2007-2012 program activities on the Alaska OCS would cause some slight, localized increases in concentrations of NO₂, SO₂, PM₁₀, PM_{2.5}, and CO in areas around the Beaufort Sea, Chukchi Sea, Bering Sea, and Cook Inlet. Concentrations would be well within the NAAQS and the PSD increments.

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Emissions from the 2007-2012 program activities on the Atlantic OCS would cause some slight, localized increases in concentrations of NO₂, SO₂, PM₁₀, PM_{2.5}, and CO in the southeastern Virginia coastal area. Concentrations would be well within the NAAQS and the PSD increments. Portions of the southeastern Virginia coastal area are classified nonattainment for O₃. Emissions from the proposed 2007-2012 program would contribute very slightly, if at all, toward exceeding the O₃ standard in those areas.

b. Impacts on Water Quality

In the Gulf of Mexico, routine activities that could potentially affect coastal and marine water quality include structure placement and removal (e.g., platforms, drilling units, and pipeline landfalls) and operational discharges and wastes. Structure placement and removal would increase suspended sediment load in the water column, resulting in temporary impacts on water quality. Operational discharges (e.g., muds, cuttings, and produced water), sanitary and domestic waste, and deck drainage could affect water quality in the immediate vicinity of the release, but such releases are expected to be rapidly diluted and dispersed by currents. However, some areas such as confined portions of some channels may be unable to assimilate bilge water and sanitary wastes, thus resulting in some regional water quality degradation. Trenching operations to bury pipelines and place drilling units and platforms would temporarily increase turbidity in the immediate vicinity of the trenching operation. Overall, marine water quality impacts from routine operations would be localized and short-term, as compliance with National Pollutant Discharge Elimination System (NPDES) permits and U.S. Coast Guard (USCG) regulations would minimize or avoid most impacts to receiving waters. Also, water quality would recover when discharges cease because of dilution, settling, mixing, and evaporation.

Impacts from accidental releases (including oil spills) on water quality would depend on the type and amount of product spilled, amount of material spilled, dispersion and weathering of the spilled material, and specific location affected. While small oil spills would have measurable impacts on water quality, water quality would rapidly recover without mitigation because of mixing, dilution, and weathering. A large oil spill may adversely affect water quality and may require cleanup to recover the affected areas. Recovery times could be decreased by cleanup activities.

In Alaska, construction and installation of exploratory and development wells, platforms, pipelines, docks and causeways, and/or artificial islands could impact water quality by disturbing sediments and increasing turbidity in the area of construction. Coastal water quality could also be impacted from construction of onshore pipelines and other infrastructure and pipeline landfalls. Proper facility siting and construction permit requirements would largely mitigate these impacts. Minor water quality contamination could also occur from fluids entrained in ice roads when they breakup in the spring. Most water quality impacts would be localized and short-term, with water quality conditions steadily improving as settling and mixing occurred. Exploration discharges would persist for a few hours within the mixing zone around each rig; however, the NPDES permit limitation on discharge rates would minimize water quality impacts. Production facilities would reinject all muds, cuttings, and production waters, thereby eliminating degradation of water quality by these effluents. Where muds, cuttings, and produced water would be discharged directly at the drill sites, nearby water quality would be adversely affected. However, materials entering the water would be quickly diluted and dispersed, and thus would not result in long-term impacts on local water quality.

While small oil spills would have measurable impacts on water quality, water quality would rapidly recover without mitigation because of mixing, dilution, and weathering. A large spill in isolated coastal waters, in shallow water under thick or rapidly freezing ice, or in the open sea when or where access to the spill site is limited could cause sustained degradation of water quality. The

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decomposition and weathering process for oil are slowed in cold water, thereby increasing the potential for more widespread and long-term water quality impacts. Overall, the impacts from a spill would depend on the spill size and composition, weather conditions and season of year, spill location, and extent and timing of cleanup activities.

In the mid-Atlantic area, the impacts associated with exploration activities on coastal water quality would be localized and short-term, while the impacts associated with development and production activities would be localized, short- to medium-term, and would most likely not result in long-term degradation to the background water quality conditions in the area. The impacts with a potential to affect coastal waters are associated with the discharges from support vessels and helicopters operating nearshore, the contribution of onshore point and nonpoint discharges into mid-Atlantic waters from support facilities, the installation of a natural gas pipeline, and accidental oil spills, including the risk of one large spill from tanker transport of oil.

The overall impacts associated with exploration, development, and production activities on marine water quality would be localized, short- to medium-term, and would most likely not result in long-term degradation to local water quality conditions. These impacts would primarily be generated from drilling activities, including the installation and operation of a drilling rig(s), platform installation and operation, and the discharges from support vessels and helicopters. The impacts would be localized and short-term. Compliance with NPDES permit requirements would minimize or prevent most impacts to receiving waters caused by discharges from routine exploration and development activities. Impacts of accidental releases to water quality would depend on the size of the spill, type of material or product spilled, and environmental factors at the time of the spill. However, there would be no long-term, widespread impairment of marine water quality. Marine water quality could be affected by platform and pipeline installations and operations, discharges, and accidental oil spills. Operational discharges would be in compliance with NPDES permit requirements that would minimize or eliminate most impacts. A large offshore spill could result in short term and localized water quality impacts.

c. Impacts on Marine Mammals

Overall, potential impacts to marine mammals from OCS-related activities in all planning areas could range from negligible to significant (if not properly mitigated). Effects may also be short- or long-term. The extent of the impact depends on a variety of factors, such as species, age, sex, reproductive status of the affected individuals; the importance of the area for carrying out important natural behaviors (i.e., feeding, molting, breeding, nursing, denning, sheltering or predator avoidance); whether other areas have suitable habitat at little energy output; and whether or not affected individuals may become acclimated to the operational activities. Effects would likely be greater to young of the year, adult females, and subadults, and during times of animal aggregations. Population level impacts are more likely for those species listed (or proposed for listing) under the ESA (e.g., polar bears, North Pacific right whales).

In the Gulf of Mexico, routine operations that could affect marine mammals include seismic surveys, construction and operation of offshore facilities, operational discharges and waste generation, vessel and helicopter traffic, and platform removal. Noise generated during exploration and production activities, platform removal, and OCS-related vessels and helicopters may temporarily disturb some individuals. Collisions with OCS-related vessels could also injure or kill some individuals, although the incidence of such collisions is expected to be very low. Many of the effects associated with noise and the presence of OCS-related vessels or structures would likely be short-term and not result in population-level effects, while some activities have the potential to result in population-level impacts,

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if not properly mitigated. Existing permit requirements, regulatory stipulations, and MMS guidelines targeting many of the routine operations would greatly limit the impact of any potential effects on marine mammals.

An oil spill may expose marine mammals (or their habitats and food resources) to oil or its weathering products. The magnitude of effects from accidental spills would depend on the location, timing, and volume of the spills; the environmental settings of the spills (e.g., restricted coastal waterway, deepwater pelagic location), and the species exposed to the spills. Spill cleanup operations could result in short-term disturbance of marine mammals in the vicinity of the cleanup activity, while a collision with a cleanup vessel could injure or kill the affected individual.

Under the proposed action, some routine operations could affect marine mammals in Alaska. Impacts to marine mammals would be a function of the extent that industrial activities coincided with the species' seasonal occupation of certain regions and the species' tolerance level of the impacts. Noise generated by exploration and operation activities and by OCS-related vessels and helicopters may temporarily disturb some individuals, causing them to leave or avoid the area. Such effects would likely be short-term and not result in population-level effects. However, if the disturbance results in the temporary abandonment of young by adults, survival of young may be reduced. Impacts would also be greater in areas where animals aggregate for feeding or breeding (e.g., polar bear groupings during the fall, bowhead whale migration). Collisions with OCS-related vessels may injure or kill some individuals, although the incidence of such collisions is expected to be low. Vessels, construction of ice roads, on-ice vehicles, and aircraft have been known to affect polar bear behavior (e.g., they may abandon dens, which could reduce cub survival). However, mitigation should reduce the level of disturbance. Existing permit requirements, regulatory stipulations, and MMS guidelines targeting many of the routine operations would generally limit the likelihood of marine mammals being affected by these operations and/or reduce the level of potential impact. The MMS will also coordinate closely with the National Marine Fisheries Service (NMFS) and the FWS to identify mitigation and monitoring measures for ESA-listed species at the regional-, site- or project-specific levels.

Compliance with the ESA and the Marine Mammal Protection Act would limit the likelihood of impacts to both listed and nonlisted marine mammals. Similarly, careful siting of onshore and offshore facilities and OCS-support vessel and aircraft routes to avoid impacts to habitats, particularly during migration, denning, or times of animal aggregations, would generally reduce the likelihood and/or magnitude of adverse impacts to marine mammals in Alaska. For example, activity restrictions related to Steller sea lion or North Pacific right whale critical habitat would greatly reduce or avoid the likelihood of routine operations impacting designated rookeries and haulouts or feeding areas, and limit how closely OCS-support vessels may approach critical habitats for this species. Mitigation measures are in place that may subject areas to seasonal drilling restrictions to prevent the endangered bowhead whale from being disrupted during its migration and when it is most likely to be hunted. The endangered fin and humpback whales would also be protected by the same mitigation measures developed to minimize disturbance to bowhead whales. The MMS will work with the FWS to further identify mitigation measures for the polar bear as the FWS prepares to list this species as threatened under the ESA.

Accidental oil spills may result in the direct and indirect exposures of marine mammals and their habitats to the oil and subsequent weathering products. Animals could be exposed by the inhalation or ingestion of oil or contaminated foods, which may result in a variety of lethal and sublethal effects. Fouling of fur of some species (e.g., sea otter and fur seal) could affect thermoregulation and reduce survival. The magnitude of effects from accidental spills would depend on the location, timing, and

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volume of the spills; the habitats affected by the spills (e.g., coastal habitats); and the species exposed. Spills in open waters may be expected to affect the fewest number of individuals, and not result in population-level impacts to any species. The greatest risk to marine mammals would be associated with large spills reaching rookeries and haulout locations or during periods of animal aggregations or critical natural behaviors (e.g., nursing, denning). Spills in these locations have the potential for affecting the greatest number of individuals or impacting the most vulnerable portions of the population and could result in population-level impacts to some species unless properly mitigated. Spill cleanup operations could result in short-term disturbance of marine mammals in the vicinity of the cleanup activity, while a collision with a cleanup vessel could injure or kill the affected individual. Also, disturbance of adults with young during cleanup could reduce survival of the young animals.

Under the proposed action, some lease activities could affect marine mammals in the Mid-Atlantic Planning Area offshore Virginia. Underwater noise is expected to be the most prevalent potential impact associated with exploration, development, and production. However, no lethal or physically debilitating impacts are expected from this source. Vessel and aircraft traffic are expected to result in occasional startle reactions and avoidance responses. A limited number of probable lethal collisions between vessels and endangered whales could occur. However, no collisions would be anticipated between vessels and the smaller cetaceans occurring on the Atlantic OCS. Muds and cuttings discharges could release toxic chemicals into the water and possibly contaminate marine mammals directly or through ingestion of contaminated prey species. Ingestion or entanglement with discarded waste could lead to intestinal blocking, reduced mobility, and other lethal or sublethal effects. Installation and operation of offshore facilities could disturb normal behaviors and could lead to avoidance or displacement from the area. The potential for impacts related to oil spills could lead to skin, respiratory, and digestive problems but are expected to be sublethal and nondebilitating unless chronic. Overall, effects from exploration, development, and production activities in the mid-Atlantic would likely be short-term and not result in population-level effects for most species of marine mammals. However, there is the slight potential for some specific activities to result in population-level impacts to ESA-listed species, if not properly mitigated (i.e., lethal ship strikes to North Atlantic right whales).

d. Impacts on Marine and Coastal Birds

In the Gulf of Mexico, routine activities that could affect marine and coastal bird species include infrastructure placement, operational discharges and wastes, and vessel and aircraft traffic. The primary effect would be disturbance of birds in the immediate vicinity of the activity. Because birds tend to habituate to human activities and noise, potential impacts from disturbance would be short-term and not be expected to result in population-level effects. However, construction activities near coastal habitats could disrupt breeding and nesting activities of colonial nesting birds. Some collision mortality with offshore platforms and, to a lesser extent, OCS-related helicopters would be expected. Collisions at offshore platforms may affect several thousand birds each year as they migrate across the Gulf in spring and fall. Because the discharge of production wastes and other materials is regulated, and because permitted production wastes discharged into marine waters would be quickly diluted and dispersed, relatively few birds would be exposed to these discharges and wastes. Loss or alteration of preferred habitat due to pipeline landfalls could result in the displacement and possible decrease in nesting activities. Compliance with regulations and corporate procedures would minimize impacts to birds, including federally-listed species.

Accidental oil spills pose the greatest threat to marine and coastal birds in the Gulf of Mexico. The magnitude and ecological importance of any effects would depend upon the size of the spill, the species and life stages that are exposed, and the size of the local bird population. Exposure to spills in

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deep water would be largely limited to pelagic birds, while shallow-water spills could affect the greatest variety and number of birds, including shorebirds, waterfowl, wading birds, gulls, and terns. A large near shore oil spill that contacts the endangered whooping crane winter habitat at the Aransas National Wildlife Refuge in Texas could result in population level impacts. Oil washing ashore may contaminate eggs and nest sites as well as foul foraging areas and food resources. Spill cleanup activities could also disturb nesting populations or habitats in nearby areas.

In Alaska, marine and coastal birds may be affected by seismic surveys; construction and operation of onshore and offshore facilities; vessel, aircraft, and on-land vehicle traffic; and noise and human activities during normal operations and maintenance activities. In most cases, disturbed birds would temporarily leave the area, while in other cases, the displacement could be long-term. Construction of onshore facilities and pipelines, offshore pipeline landfalls, and offshore gravel islands (to support drilling platforms) would result in the permanent disturbance of potential habitat within the immediate footprint of the new facilities and gravel excavation areas. Depending on the species present at and in the vicinity of the construction areas, the numbers of birds affected, and the activity (nesting, molting, feeding, staging) that the affected birds were undergoing at the time of disturbance, the displacement could reduce reproductive success, foraging success, and survival, and could result in population-level impacts. New onshore facilities may result in local increases of predator species such as the arctic fox and glaucous gull. Increases in these predators would increase predation pressure of local bird populations and, depending on the birds affected, could result in population-level effects. Compliance with regulations and corporate procedures would minimize impacts to birds, including federally-listed species.

In the event of an accidental oil spill, exposed marine and coastal birds may experience a variety of lethal or sublethal effects, and the magnitude and ecological importance of any such effects would depend upon the size and location of the spill, the species and life stage of the exposed birds, and the size of the local bird population. Although the potential for a large spill is unlikely, it could result in the loss of large numbers of birds, and result in potentially long-term reductions in populations. Spills in offshore locations have the greatest potential for affecting the greatest number of birds, especially if a spill occurs in or reaches an area where birds have congregated and are carrying out important activities (e.g., nesting, molting, and staging). A spill in onshore habitats would affect relatively few birds unless the spill was to reach a surface water body such as a stream, pond, or lake that provides important nesting, brood-rearing, foraging, or staging habitat. Population recovery from high adult mortality during a large oil spill could take many years. Spill cleanup activities may also disturb birds in the vicinity of the cleanup, causing them to leave the vicinity of the cleanup activity.

Marine and coastal bird populations on the mid-Atlantic are not expected to be measurably affected by the routine activities assumed for the proposal. Federally-listed, coastal-oriented endangered species and species of concern are not likely to be adversely affected by exploratory drilling in the proposed lease area. Disturbance from the low level of vessel and helicopter traffic expected in the mid-Atlantic is not likely to cause impacts to marine and coastal birds. Because of the relatively low estimated number of oil spills, there is a low risk of impact resulting in some losses of marine birds, particularly for pelagic birds and sea birds. The long-term effect could be a small reduction in population sizes for a few species. Small spills are expected to result in very few deaths among susceptible species, but it is not expected that these losses would be measurable against natural fluctuations within affected populations. In the unlikely event that a large spill occurred, marine or coastal bird species would not experience measurable impacts at the population level. Local impacts however could, under certain circumstances, be high depending on the location and time of year in which the spill occurred.

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e. Impacts on Terrestrial Mammals

In the Gulf of Mexico, routine operations that could affect terrestrial mammals include construction and maintenance of onshore infrastructure and pipelines, and support vessel and aircraft traffic. The terrestrial mammals of primary concern are the federally-listed Alabama, Choctawatchee, St. Andrew, and Perdido Key beach mice, and the Florida salt marsh vole. Because the habitats of these species are located within protected areas, they are buffered from contact with existing OCS industry infrastructure. New pipeline landfalls and onshore OCS-related facilities would not adversely impact these species because the proposed action will not result in activities where the species' habitat occur, and the species occur within protected areas that further preclude the species or their habitats from incurring adverse impacts.

Due to their location on inner dunes, the habitats of the beach mice species are unlikely to be affected by an accidental oil spill. The Florida salt marsh vole is located far from areas where oil leasing and development may occur under the proposed action. Thus, it is unlikely that this species or its habitat would be affected by an accidental oil spill from OCS activities.

In Alaska, the terrestrial mammals that may occur or utilize coastal and/or inland habitats potentially affected by OCS activities (e.g., construction and maintenance of onshore infrastructure and pipelines, and support vehicle and aircraft traffic) include caribou, muskoxen, grizzly and black bears, and foxes. Disturbance of terrestrial mammals during construction would be localized and temporary, affect a relatively small number of individuals, and not be expected to result in long-term impacts to mammal populations. Winter construction could disturb individual bears if their dens are located near construction areas. Overwintering caribou and moose could also be disturbed by construction activities. Disturbance of wildlife could affect overall condition and affect subsequent survival or reproductive success, especially if animals are displaced from calving or wintering habitats to less optimal habitats. Siting onshore facilities to avoid important calving or wintering areas would reduce the likelihood of long-term impacts to the survival or reproduction of affected species.

Facility construction in the Alaskan planning areas would also result in the long-term loss of a relatively small amount of habitat and in the death of a few individuals (primarily small mammals such as mice and voles) unable to flee the construction areas. The amount of habitat loss would be very small compared to that available throughout the area. Operation of onshore facilities could result in the long-term avoidance of adjacent habitats by species sensitive to noise and human activity. The presence of a new pipeline may affect daily or seasonal movements of caribou. The condition of individuals displaced from preferred to less optimal habitats could be adversely affected, thus affecting their subsequent survival or reproductive success. However, some wildlife species, such as bears and foxes, become habituated to human activities and facilities. Grizzly and black bears may incur defense of life or property-related mortality if they become habituated or attracted to new onshore facilities. Increased fox densities caused by human activity and facility presence could result in increased predation on local natural prey species and may also result in an increase in the incidence and transmission of diseases such as rabies.

In the event of an accidental spill in the Alaskan planning areas, terrestrial mammals may be exposed via ingestion of contaminated food, inhalation or airborne oil droplets, and direct ingestion of oil during grooming, which may result in a variety of lethal and sublethal effects. An oil spill may also affect the habitats of terrestrial mammals, resulting in reduced food supply (e.g., oiling of vegetation) or reduced physical habitat quality (e.g., oiled sands or fouling of nests and burrows). Because most spills would be relatively small (< 50 bbl), relatively few individuals would likely be exposed. A population-level adverse impact would only be expected if the spill was very large or contaminated a crucial habitat area where a large number of individual animals were concentrated (e.g., a riparian area

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used by moose). However, population-level impacts would not be expected for most species. Cleanup activities could temporarily disturb terrestrial mammals in the vicinity of the cleanup operation, and would not be expected to result in population-level impacts. An exception could be if muskoxen were displaced from preferred overwintering areas in the Arctic. This could adversely affect their overwinter survival and condition, and subsequent calving success, resulting in local population-level impacts.

f. Impacts on Fish Resources and Essential Fish Habitats

In the Gulf of Mexico, routine operations that may affect fish resources, including essential fish habitat (EFH), include exploratory surveying and drilling, installation and removal activities, and operational discharges. Seismic survey airgun discharges could result in temporary displacement of fishes. The impact to overall fish population would be negligible since fishes are distributed over wide geographic areas, and seismic operations would be localized. Sediment disturbance during placement of platforms and pipelines will increase turbidity which, in turn, will temporarily impact the water quality of EFH within a small area, causing fish to temporarily disperse. Once put in place, platforms serve as artificial reefs or fish attraction devices, benefiting those species preferring bottom relief. During platform removal, explosives may injure biota and destroy invertebrate and fish communities in the immediate vicinity of the platforms and those that are prey for managed fish species. Considering the small proportion of EFH area that could be affected, potential impacts on EFH due to routine operations under the proposed action would also be limited. Impacts on the Gulf sturgeon are not likely to occur because there is relatively little overlap between the locations that could be affected by the proposed action and the distribution of the threatened Gulf sturgeon.

Effects of oil spills would depend on the location, timing, and volume of the spill, in addition to other environmental factors. Small spills are unlikely to affect a large number of fish or EFH before dilution and weathering would reduce concentrations of toxic fractions to sublethal or nonlethal levels and would, therefore, not have substantial effects on fish populations. It is anticipated that any single large spill in offshore waters would affect only a small proportion of a given fish population (including the Gulf sturgeon) and that fish resources would not be permanently affected. A large spill that reaches submerged seagrass beds or coastal wetlands could have more persistent impacts on EFH and could require remediation. Few impacts would be expected because of the wide dispersal of early life history stages of most fishes in the surface waters of the Gulf of Mexico.

In Alaska, routine operations that may affect fish resources, including EFH, include exploratory surveying and drilling, installation activities, and operational discharges. Seismic survey airgun discharges can affect pelagic fish species with swim bladders. Temporary displacement of fishes is the most probable effect of noise generated by seismic surveys. The impact to overall fish population would be negligible since fishes are distributed over wide geographic areas, and seismic operations would be localized. In Alaska, sediment disturbance, resuspension, and displacement from routine activities would affect EFH in a similar manner as that in the Gulf of Mexico. Assuming compliance with existing Federal, State, and local regulations, policies and consultations, most impacts to fish resources would be minimized, and most impacts to EFH from routine activities under the proposal will be avoided. Although some individual fish are likely to be harmed by activities associated with routine operations, the mitigation measures imposed on leasing activities would limit the scope of these impacts.

Effects of accidental oil spills would depend on the location, timing, and volume of spills; distribution and ecology of affected fish species; and other environmental factors. Small spills would be localized and are unlikely to affect substantial number of fish before dilution and weathering would reduce

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concentrations of toxic fractions to sublethal or nonlethal levels. Under most circumstances, a large spill would affect only a small proportion of a given fish population, and therefore overall population levels would not be affected. Oiled intertidal areas could lead to considerable mortality of eggs and juvenile stages of some pelagic species in the affected areas. One or more years could be required for population levels to recover. Spilled oil reaching wetland habitat, including salt marshes, could kill vegetation and associated invertebrate species and small fish that are prey species for Pacific salmon. Large spills that reach coastal streams used by Pacific salmon species could have more persistent impacts and require remediation.

Because fishery resources are widespread through the Mid Atlantic Planning Area and the level of exploratory activity is projected to be minimal, impacts in the proposed sale area would only affect a small portion of the population. No impacts to fish population distribution and abundance would occur. Impacts on fish resources may result from the discharge of operational effluents, muds, and cuttings; platform and pipeline emplacement; structure removal; lights on offshore rigs; noise associated with routine drilling operations or geophysical surveys; and discharge of formation or produced waters. Based on the assumptions for the proposal, individual finfish or shellfish are expected to experience sublethal impacts such as reduced biogenic activity, reduced metabolic functions, or disease. Deaths of a few individuals are also expected. However, no measurable decline in whole populations is expected. The anticipated duration of impacts is less than one generation or 1-3 years for most activities and events. Recovery of fish in localized inshore habitats contaminated by an oil spill could require 2-12 years. No measurable impact to species of concern is expected as a result of the proposed activity.

g. Impacts on Sea Turtles

Five species of sea turtles occur in the Gulf of Mexico: green, hawksbill, Kemp's ridley, leatherback, and loggerhead. All of these species may be found as hatchlings, juveniles, and adults in the Gulf of Mexico program area. All but the hawksbill have been reported to nest on beaches within the Gulf of Mexico planning areas.

Sea turtles could be directly affected by seismic surveys, vessel traffic, construction of offshore and onshore facilities, and removal of platforms. Sea turtles may also be exposed to a variety of waste materials, such as produced water, which have the potential to cause a variety of lethal and sublethal effects. Noise generated during exploration and production activities and platform removal may result in the temporary disturbance of some individuals, while some turtles may be killed during the use of underwater explosives for platform removal. The construction and operation of new onshore facilities may impact nest sites, possibly result in eggs being crushed, and disturb hatchling movement from the nest sites to the water. Sea turtles may also be injured or killed by collisions with OCS vessels. Existing permit requirements, regulatory stipulations, and MMS guidelines and required mitigation measures targeting many of the routine operations could limit the seriousness of any potential effects on sea turtles. Therefore, while routine operations could affect individual sea turtles, population-level impacts are not expected.

Oil spills may result in the exposure of one or more sea turtle life stages to oil or its weathering products. Oil may reduce egg hatching and hatchling survival, and may inhibit hatchling access to water. Hatchlings, juveniles, and adults may inhale or ingest oil and oil vapors, and may incur any of a variety of physiological impacts. The presence of oil slicks or oiled beaches may alter habitat use and affect nest site access and use. Small spills are unlikely to affect a large number of sea turtles or their habitats and thus are not expected to have substantial or long-term effects. A large spill could affect many more individuals and habitats, including nesting beaches, and potentially incur population-level

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effects. The magnitude of effects from accidental spills would depend on the location, timing, and volume of the spills; the environmental settings of the spills; and the species and life stages of sea turtle exposed to the spills. The rapid deployment of spill-response teams and implementation of cleanup activities could limit the magnitude of impacts; however, cleanup operations themselves could also impact sea turtles or their habitats due to artificial lighting at night, machine and human activity and related noise, sand removal and cleaning, and the use of dispersants and coagulant chemicals.

Sea turtles are occasionally sighted in southern Alaska during the summer months but are not found in the Bering Sea or Arctic areas.

It is not expected that exploration, development, and production activities would affect populations of marine turtles in the mid-Atlantic. The generally inshore distribution of these animals, as well as their seasonal geographical distribution on the Atlantic OCS, substantially reduces the potential for impacts stemming from routine gas and oil activities offshore. Other than collisions with vessels and accidental oil spills, potential impacts are expected to be sublethal. Impacts from routine activities and small accidental events are not expected to measurably affect the distribution, behavior, or population size of marine turtles on the Atlantic OCS. An oil spill of 1,500 bbl in size would result in more measurable impacts and possibly would affect sea turtle populations in the area.

h. Impacts on Coastal Habitats

In the Gulf of Mexico, routine operations could impact coastal habitats as a result of pipeline construction, maintenance dredging of inlets and channels, and vessel traffic. The magnitude of these impacts would depend on the location of new construction, the level of dredging or shipping activity in a specific area, and existing environmental conditions (such as ongoing shoreline degradation). Stabilization of dune margins could be difficult, and establishment of vegetation cover might be slow, possibly resulting in prolonged losses of dune habitat on barrier beaches near pipelines. Direct impacts to barrier islands are frequently avoided during pipeline construction by the use of nonintrusive construction techniques and by pipeline installation using directional boring. Construction could impact wetlands due to habitat fragmentation and isolation and altered hydrology. Additional wetland losses could occur along pipeline routes and navigation channels as a result of the continued erosion of adjacent marsh substrates and subsequent conversion of marsh habitat to open water. Impacts to wetlands from construction could be minimized by maintaining buffers around wetlands and by the use of best management practices for erosion and sedimentation control.

The magnitude of potential oil-spill impacts would depend on a variety of factors, including the location and size of the spill, remediation efforts, existing environmental conditions (such as plant species or substrate type), and natural localized erosion and deposition patterns. If a large oil spill were to reach coastal wetlands, these resources may not fully recover even if remedial actions were undertaken. Cleanup operations might also impact coastal habitats if the removal of contaminated substrates affected beach stability and resulted in accelerated shoreline erosion or if coastal wetlands were damaged (e.g., by trampling or removal of vegetation).

In Alaska, routine operations could have impacts on coastal barrier beaches and dunes and on wetlands, primarily as a result of pipeline construction, shore base construction, and vessel traffic. The magnitude of these impacts would depend on the location of new construction, the level of shipping activity in a specific area, and existing environmental conditions (such as ongoing shoreline degradation). Small areas of coastal habitat will be lost or degraded from pipeline landfalls and placement of vertical support members for aboveground onshore pipelines, onshore bases, and roads. Also, dredging of intertidal habitats for pipeline burial would disturb benthic communities at the site

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of the trench. The impacts of buried pipelines and pipeline landfalls and related causeways to benthic communities would be localized.

Potential impacts from oil spills could occur to coastal habitats. The magnitude of these impacts would depend on a variety of factors, including the location and size of the spill, remediation efforts, existing environmental conditions (such as plant species or substrate type), and natural localized erosion and deposition patterns. Cleanup operations might also impact coastal habitats if the removal of contaminated substrates affected beach stability and resulted in accelerated shoreline erosion or if coastal wetlands were damaged (e.g., by trampling or removal of vegetation).

Exploration, development, and production activities could have impacts on the coastal barrier beaches and dunes of the mid-Atlantic area primarily as a result of pipeline construction and vessel traffic. Impacts on wetlands could result from construction activities and indirect impacts as a result of poorer water and air quality and altered hydrology. The magnitude of these impacts would depend on the location of new construction, the level of shipping activity in a specific area, and existing environmental conditions (such as ongoing shoreline degradation). Potential impacts from spills could have direct impacts on wetlands and beach habitats. Impacts to wetlands from small spills are expected to be limited to temporary shifts in flora and fauna ratios in the vicinity of support bases. No measurable impact to shorelines is expected from small spills. The magnitude of impacts from a large spill would depend on a variety of factors, including the location and size of the spill, weather conditions, remediation efforts, beach conditions (e.g., grain size), existing environmental conditions (such as plant species or substrate type), and natural localized erosion and deposition patterns. Cleanup operations themselves might also impact wetlands, estuaries, beaches, and dunes. Adverse impacts on coastal habitats from a large spill can range from insignificant to high degrees of damage, including extensive loss of habitat.

i. Impacts on Seafloor Habitats

In the Gulf of Mexico, routine operations that could affect seafloor habitats include placement and removal of structures, vessel traffic, and/or permitted operational discharges. The benthic communities associated with topographic features are sensitive to physical damage (e.g., by placement of structures or anchors) and operational discharges (e.g., drilling muds and cuttings). However, these impacts would be avoided through compliance with the Topographic Features Stipulation and the establishment of No Activity Zones. The installation of mobile drilling units or production platforms and pipeline placement and removal could also impact other seafloor habitats. However, protective lease stipulations exist for seafloor habitats such as live bottom and pinnacle trend areas. Any seafloor habitats that are damaged would eventually recover over a period of years. Most impacts that could occur from drilling muds and cuttings and produced water discharges would be avoided as a result of compliance with the Live Bottom Stipulation that requires the avoidance of live bottom areas and NPDES permit restrictions that limit the types and amounts of discharges allowed near live bottom areas.

Impacts from routine operations to seagrass beds could be avoided by routing the pipelines corridors around seagrass beds. Chemosynthetic (seep) communities would be protected from damage associated with anchoring and placement of structures through siting restriction requirements.

Potential impacts on seafloor habitats and associated benthic communities from accidental oil spills could occur. The magnitude of these impacts would depend upon the location, size, and type of spill; weather conditions; effectiveness of cleanup operations; and other environmental conditions at the time of the spill. For example, given the water depths (e.g., 200 m) of the topographic features, it is

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unlikely that significant amounts of oil from surface spills would reach the sensitive communities. Because of the Live Bottom Stipulation, the potential for impacts from oil spills is greatly reduced. If a large spill from a pipeline were to occur, there could be lethal effects on the biota in localized areas that receive large quantities of oil. In such cases, the community would recover once the area had been cleared of oil, although full recovery could take many years. In most cases, effects on sensitive biota would be sublethal, with recovery occurring within months to a few years. The benthic community would probably recover more quickly from a shallow-water pipeline spill than from a deepwater pipeline spill, because of the greater potential for wave-induced suspension of sediments in shallow water.

In Alaska, routine operations that could affect seafloor habitats include seismic surveys, drilling of wells, placement of structures, and/or permitted operational discharges. It is anticipated that planning procedures and permitting requirements would avoid or minimize the potential for impacts to the Stefansson Sound Boulder Patch community in the Beaufort Sea Planning Area. Routine activities would not measurably affect local populations of lower trophic-level organisms in other seafloor habitats. At most, platform and pipeline installation would alter species diversity within a small area near the facility. For example, the presence of platforms or artificial islands would favor organisms requiring hard substrates, thereby shifting community composition in some areas. Small areas on intertidal habitat could also be affected by pipeline landfalls. It is anticipated that these development activities could displace some coastal organisms but would have no measurable effect on local populations. The stipulation on protection of biological resources, which requires surveys near, and avoidance of, special benthic habitats, would help to reduce potential impacts to both nearshore and deeper-water biota.

In the event of an oil spill, seafloor benthic communities are unlikely to be heavily oiled since most of the oil would float. Sublethal impacts associated with low concentrations of oil in the water column would be expected in the immediate vicinity of the spill. A large spill associated with a rupture or leakage from buried offshore pipelines could contaminate sediments within the immediate area. Organisms in those sediments could experience high levels of contamination and mortality, but would represent a very small proportion of the overall area available to support similar benthic communities.

In the mid-Atlantic, during exploration there would probably be some unavoidable localized benthic population reductions due to changes in sediment characteristics from the discharge of drilling muds, cuttings, and water, and from the ingestion of oil and other materials in the sediment by benthic organisms. However, it is unlikely that any demersal fish populations would be adversely affected by this low level of activity. During the development and production stages, there would probably continue to be some unavoidable localized benthic population reductions due to changes in sediment characteristics from the discharge of drilling muds and cuttings and from the ingestion of spilled oil in the sediment by benthic organisms. These effects would be most pronounced in areas of high biological productivity and increased ecological sensitivity, such as nearshore areas, hard bottoms (including reef structures and artificial obstructions), and the heads of submarine canyons. However, lease stipulations, the large area over which the activities would occur, and the extensive timeframe during which they would likely happen should result in small, if any, adverse impacts to the environment. Impacts from blowouts, bottom disturbances, and discharges will be mitigated by lease stipulations and regulations to minimize impacts to benthic resources.

j. Impacts to Areas of Special Concern

In the Gulf of Mexico, routine activities that could affect areas of special concern such as national marine sanctuaries, parks, reserves, and refuges include placement of structures, pipeline landfalls,

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operational discharges and wastes, and vessel traffic. However, impacts from these activities are unlikely. Potential impacts on the Flower Garden Banks National Marine Sanctuary due to routine operations under the proposed action would be largely prevented by (1) provisions of the Topographic Features Stipulation that prohibits exploration or development activities in the immediate vicinity of the banks, (2) the subsea location of the features, and (3) ocean currents that circulate around the banks. Among the national parks located in the Gulf of Mexico, only the Padre Island National Seashore and the Gulf Islands National Seashore are located adjacent to regions within which oil and gas activities could occur under the proposed action. No infrastructure (e.g., pipeline landfalls, shore bases) would be sited in national parks, national wildlife refuges (NWR's), or national estuarine research reserves. Some OCS-related trash and debris could wash up on beaches. Over time, vessel wakes can erode shorelines along inlets, channels, and harbors. However, existing mitigation measures limit vessel speeds in inland waterways, so impacts would be reduced. Thus, impacts to areas of special concern would be avoided.

While an oil spill could affect areas of special concern, the magnitude of the potential impact will depend on the location, size, and type of spill; weather conditions; effectiveness of cleanup operations; and other environmental conditions at the time of the spill. However, impacts from oil spills would be unlikely because of the assumption that 75 percent of the hydrocarbons developed as a result of the 2007-2012 program would occur in deep water (> 330 m) located far from the shoreline. Also, the Topographic Features Stipulation prohibits exploration or development activities in the immediate vicinity of areas such as the Flower Garden Banks National Marine Sanctuary. Thus, it is unlikely that an oil spill would affect such offshore areas. In the unlikely event of oil contaminating a shore-based area of special concern, impacts could include the destruction of wetland vegetation and associated wildlife, oil saturation and trapping by vegetation and sediments, and mechanical destruction of the wetland area during cleanup.

In Alaska, no OCS-related activities will occur in national park lands in the Arctic Subregion under the proposed action, thereby minimizing the potential for impacts from routine operations in these areas. Impacts from routine activities in adjacent areas would be minimal under the proposed action. Development may be possible in the Alaska Maritime NWR under the proposed action, but it is anticipated that reviews of individual lease sales would minimize the potential for impacts from routine operations. Routine exploration and development activities in offshore areas distant from NWR areas would have only a limited potential to affect resources on these refuges because they are located relatively far from shoreline areas. However, there could be a potential for effects on wildlife refuges from development and operation of facilities to support offshore oil drilling and production. This could include habitat degradation or loss due to nearshore dredging, construction of access roads, construction and operation of processing and waste facilities, construction and operation of shore bases, and construction of onshore pipelines.

There are no national park or national forest lands that would be affected by exploration, development, or production activities within the North Aleutian Basin Planning Area. Site-specific reviews of individual lease sales would likely minimize the potential for impacts to NWR properties from routine operations due to onshore or nearshore development activities.

Development of onshore facilities within national park lands in the Cook Inlet Planning Area is considered unlikely, thereby minimizing the potential for impacts from routine OCS operations in these areas. However, offshore construction of pipelines and platforms could have temporary effects on wildlife due to noise and activity levels and on scenic values for park visitors. Development may be allowed in the Gulf of Alaska Unit of the Alaska Maritime NWR. However, it is anticipated that

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reviews of individual lease sales would minimize the potential for impacts from routine operations due to development activities. It is possible pipelines could be constructed on refuge lands.

Impacts from oil spills that occur adjacent to national park or NWR boundaries would depend on spill location, spill size, type of product spilled, weather conditions, environmental conditions at the time of the spill, and effectiveness of cleanup operations. Large oil spills that contact shoreline areas of NWR's would likely impact coastal habitats and fauna negatively and could also affect subsistence use, commercial or recreational fisheries, and tourism. No effects to national forests would occur because there would be no onshore OCS development within or in the immediate vicinity of national forest lands and because spills would not be expected to come in contact with national forest lands.

Exploratory oil and gas activity in the Atlantic would be prohibited in designated areas of special concern throughout the proposed leasing area. Activities outside these areas may cause impacts within their boundaries that could compromise the integrity of protected marine and coastal environments, thus threatening visitation and use, awareness, and support for current and future protections. The low level of exploratory activity projected and the use of mitigation measures, including lease stipulations, would minimize the risk to these areas. No measurable impacts to these features are expected as a result of exploratory activities. It is unlikely that oil and gas activity would significantly impact areas of special concern within the proposed lease area, although large spills have the potential to threaten protection efforts. Mitigation efforts and thorough contingency planning by multiple parties will minimize the risk to these areas.

k. Impacts on Population, Employment, and Regional Income

The main effect of the proposed action on population and employment will be the employment generated by the expected routine OCS oil and gas activity. MMS has developed a new economic impact model (MMS Alaska-GOM Modeling Using IMPLAN). Based on the exploration and development scenarios, potential effects from routine operations would be small in the Gulf of Mexico, Alaska, and the mid-Atlantic. Employment impacts of oil spills reaching landfall can vary considerably given the volume of oil reaching land, land area affected, and sensitivity of local environmental conditions. A large oil spill might have short-term (one season or less) effects.

In the Gulf of Mexico, the proposed action is likely to add 20,250-34,700 jobs in an average year. Most employment effects would concentrate in Louisiana and Texas; however, even in the most affected areas, the added employment demands are not likely to stress the local labor market. Population increases across the region would be small but noticeable in some locations, ranging from 38,500 to 66,000 over the life of the proposed action. Oil spills could affect such activities as beach recreation, diving, commercial diving, recreational fishing, and sightseeing. Studies have shown that there could be a one-time seasonal decline of 5-15 percent in tourist visits associated with a major spill. Employment and regional income impacts from spills would likely be greatest in Texas and Florida. However, the associated loss of business would be localized, with tourist movement to other coastal areas in the region offsetting a reduction in the number of visits to the affected area.

In Alaska, the proposed action is expected to add 12,600 jobs (the largest share on the North Slope) and \$192 million in personal income in an average year. Alaska is projected to grow by 14,000 residents. Workers at North Slope sites stay in enclave housing separate from local communities, and most live in south-central Alaska or the Fairbanks area. Since similar worker-residential patterns are likely elsewhere, population increases will be concentrated in places such as Anchorage and will have few effects on local communities. A large oil spill could have short-term effects (one season or less)

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on the tourism and fishing industries. It would also cause some short-term (up to 15 months) local employment, possibly generating moderate local employment effects.

In the mid-Atlantic, economic impacts would occur mainly in Hampton Roads, an area that includes the cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, Suffolk, and Virginia Beach, and in the waters of the mouths of the Elizabeth River and James River into the Chesapeake Bay and leading to the Atlantic Ocean. During the exploration phase, there would probably be some small increase in local revenue, but a small increase compared to the size of the Hampton Roads economy. Some local labor would be needed to support supply boats and helicopters, but at a level so small there would be little impact on overall employment and unemployment. Equipment to support the exploration phase, with the possible exception of crew boats and helicopters, would most likely be brought in from outside the local area. The necessary expertise in development and production of oil and gas does not exist in Hampton Roads, and workers with these skills would have to be imported from other areas where offshore drilling is already being done. However, there is a large labor pool in the Hampton Roads area, including workers skilled in construction and maritime trades. These workers could provide support services in the drilling and pipe-laying phases, as well as in the construction of needed onshore facilities such as the service base, gas processing facility, and pipe coating yard. Any increase in population as a result of development and production is not expected to have a significant impact on the housing market or on the economy. Purchases of food, transportation, and other miscellaneous supplies are not likely to have an impact on the Hampton Roads economy as a whole. Depending on the location, a large spill could affect the recreation, tourism, commercial fishing, and cruise ship economies, and possibly negatively affect the real estate market, resulting in temporary losses of jobs and income.

I. Impacts on Sociocultural Systems and Environmental Justice

Impacts on sociocultural systems and environmental justice (EJ) vary across OCS Regions. In the Gulf of Mexico, where sociocultural systems have long experienced offshore operations, and in the Hampton Roads area, where activities would be few and concentrated in industrialized and heterogeneous areas, impacts to sociocultural systems would be few. In Alaska, should a large oil spill occur and impact subsistence or commercial harvesting, effects to sociocultural systems and EJ could be substantial.

In the Gulf of Mexico, the greatest impacts to sociocultural systems are expected to result from the ongoing expansion of deepwater and ultra-deepwater activities. These trends have contributed to the cultural heterogeneity of the area and the offshore workforce; to a wider geographic range from which workers are drawn; and to the creation of jobs that require more specialized skills and longer, unbroken periods of work offshore. Accidents are not expected to alter sociocultural systems.

A large EJ concern is the potential risk to residents from nearby OCS-related infrastructure including helipads, heliports, waste management facilities, pipe coating yards, petrochemical plants, shipyards, platform fabrication yards, supply bases, natural gas storage facilities, repair yards, refineries, port facilities, and terminals. In the Gulf of Mexico, the proposed action is not expected to significantly change the risk exposure of nearby residents. Given current infrastructure distributions, coastal demographic patterns, and the distance from shore of likely deepwater activities, any new infrastructure, air emissions, or oil spills that result from the proposed action are not expected to have disproportionate environmental or health effects to low-income or minority populations.

In Alaska, impacts to sociocultural systems come from two sources. Revenues derived from the petroleum industry provide much of the funding for infrastructure and public services (e.g., education)

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throughout the State. While these impacts are positive, State revenues from the OCS program are limited. Impacts can also come from interference with subsistence, an important dietary resource and fundamental expression of Native social organization and culture, and from interference with commercial fishing, an economic mainstay of rural South Alaska and Bering Sea Subregions. Routine operations will not affect fishing and the effects of new onshore infrastructure are expected to have only minor, local effects on terrestrial harvests (by affecting access). Noise disturbance from offshore operations could significantly affect marine mammal harvests and is a particular concern with bowhead whaling, but this is expected to be mitigated through consultation and conflict avoidance measures. The *Exxon Valdez* oil spill has shown that substantial impacts occur from direct effects upon resources and from disruptive cleanup efforts. Potential impacts on sociocultural systems from accidents under the proposal would be determined by the location and timing of the spill.

Alaska's 2000 population is 29 percent minority, including 15.5 percent American Native. About 9.4 percent of its population is below the poverty line. With the exception of the Cook Inlet area in south-central Alaska, all regions addressed by the proposal have significantly larger minority populations than the State as a whole. Only northwest Alaska has a disproportionate percentage of residents below the poverty line. Alaska Native populations are present in many coastal areas and could be near any new onshore infrastructure resulting from the proposal, raising potential environmental and health concerns. The importance of marine mammals (such as the bowhead whale) to subsistence raises particular concerns. Should an oil spill occur, its potential environmental and health impacts on Alaska Native populations could be disproportionately high or adverse depending on the geographical location of the spill and its effects on subsistence resources and harvests. Because of these concerns, MMS continues to emphasize consultation and interactions with Native organizations to evaluate potential actions and mitigations.

In the mid-Atlantic, the activities that would occur during exploration would be concentrated in industrial-port areas and would be limited in size and duration. They would be unlikely to have noticeable sociocultural effects. During the exploratory phase of the operation, there would be a limited need for local workers—particularly those with maritime and construction skills—as well as some support businesses such as food service and temporary housing. Availability of workers from the current population in Hampton Roads is assured because of the large, skilled, labor pool that exists in the region, and it is likely that the few jobs available for local workers would be available to all eligible applicants, regardless of race or ethnic origin. A wider range of activities would occur during development than during exploration. While most would occur in industrial-port areas and have limited sociocultural effects, some, such as pipeline landfalls, might occur outside of these areas. Because of the level of population diversity in the Hampton Roads area, opportunities for work would not be constrained by race or ethnic background. Because the Hampton Roads area is ethnically and racially integrated, the limited sociocultural effects of new OCS-related activity and infrastructure would probably not have a disparate impact on minorities or low-income families. Likewise, if a large oil spill occurred in the area, it probably would not have a disparate impact on minorities or low-income families. The proposal may have a low level of socioeconomic impacts on the Hampton Roads area; however, there would not be disproportionately high and adverse human health or environmental impacts on minority or low-income populations. Thus, the activities likely under the proposal do not raise strong EJ concerns.

m. Impacts on Archaeological Resources

Archaeological resources that could be affected by the proposed action include historic shipwrecks and inundated prehistoric sites offshore, and historic and prehistoric sites onshore. Although shipwrecks tend to concentrate in shallow, nearshore waters in all OCS Regions, historic shipwrecks are scattered

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across the entire continental shelf, and many are found even in deepwater areas. Inundated prehistoric sites may occur on those portions of the continental shelf that were exposed as dry land during the period of lower sea levels of the last ice age. The extent of the continental shelf that was exposed varies from area to area; however, globally, sea levels were approximately 120 m lower than present approximately 21,000 to 19,000 years ago. Onshore historic properties include sites, structures, and objects such as historic buildings, forts, lighthouses, homesteads, cemeteries, and battlefields. Onshore prehistoric archaeological resources include sites, structures, and objects such as shell middens, earth middens, campsites, kill sites, tool manufacturing areas, ceremonial complexes, and earthworks.

Routine operations associated with the proposed action that may affect archaeological resources in all regions include drilling wells, installing platforms, installing pipelines, anchoring, and constructing onshore infrastructure. Existing Federal, State and local laws and regulations require that archaeological surveys be conducted prior to permitting any activity (onshore or offshore) that might disturb a significant archaeological site. Compliance with existing laws and regulations will protect archaeological resources to the maximum extent possible from most impacts associated with routine activities; however, it is still possible that some impacts could occur.

Should a direct physical contact between a routine activity and a shipwreck site occur, it could destroy fragile ship remains and could disturb the site context, resulting in a loss of data on ship construction, cargo, and the social organization of the vessel's crew, as well as the concomitant loss of information on maritime culture for the time period from which the ship dates. Ferromagnetic debris associated with OCS operations could mask the magnetic signature of historic archaeological resources, making them difficult to detect with magnetometers. Interaction between a routine activity and a prehistoric archaeological site could destroy artifacts or site features and could disturb the stratigraphic context of the site.

Oil spills could affect coastal historic and prehistoric archaeological resources and could result in unavoidable loss of information. The level of this impact would depend on the significance and uniqueness of the information lost. Archaeological resource protection during an oil spill requires specific knowledge of the resource's location, condition, nature, and extent prior to impact; however, the coastal areas of the various OCS Regions have not been systematically surveyed for sites. Existing information indicates that prehistoric sites in all regions occur frequently along the mainland coast and barrier islands, and along the margins of estuaries, bays and lagoons; thus, any spill that contacts these areas could involve a potential impact to a prehistoric site.

n. Impacts on Land Use and Existing Infrastructure

In the Gulf of Mexico, routine operations could affect land use and existing infrastructure through construction of pipeline landfalls and onshore support facilities, related petroleum industry support facilities, and new worker in-migration. The impact level would depend upon the amount of new construction and the degree to which the area is already developed. Given the current level of existing infrastructure in the Gulf of Mexico and the region's history with oil and gas operations, impacts to land use and existing infrastructure would be limited. The oil and gas industry has been an integral part of the Gulf of Mexico economy for decades, and the continuation of industry activities is not expected to result in any extensive land-use or infrastructure impacts for the region. Potential impacts resulting from new developments include the conversion of land from other uses, increased demands on roads and utilities, and increased demand for housing and public services (e.g., schools and hospitals) due to the in-migration of workers and their families. The nature and extent of these impacts, especially those associated with the construction of gas-processing facilities, would depend on the specific locations chosen for construction.

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Projected impacts to land use and existing infrastructure resulting from an oil spill would likely include stresses of the spill response on existing infrastructure, direct land-use impact (such as impacts of oil contamination to a recreational area or to agricultural land), and restrictions of access to a particular area while the cleanup is being conducted. These impacts are expected to be temporary and localized. The magnitude of the impacts would depend upon the location and size of the spill; the greatest potential would occur from a large spill in shallow water.

In Alaska, routine operations could expand existing land-use infrastructure and transportation systems due to the construction of support bases, terminals, airfields, pipelines, and roads. The proposed action would impact land use in the vicinity of new processing and transport facilities and their associated infrastructure. Routine operations associated with the proposed action could significantly affect land use in the Arctic Subregion by building pipelines (subsea and overland), service roads, and new or expanded marine-support facilities, petroleum processing facilities, and airfields. Impacts associated with platform and pipeline construction would be temporary. Impacts could result from an influx of workers to the region, as housing and expanded community infrastructure could be needed. The impacts of the proposed action on land use and infrastructure would depend on the timing, size, and duration of the activities, and may vary from light but concentrated activities to a large-scale activity in differing drilling locations. The potential for impacts to the road system infrastructure may be high if a new permanent road system is built outside of, and links up with, the existing system (e.g., the Prudhoe Bay/Kuparuk Unit road system in the Arctic Subregion). Depending on the locations chosen for land-based facilities, a change from an existing land use (e.g., undeveloped, commercial, or residential) to an industrial land use would likely occur.

The construction of petroleum industry facilities would expand the area potentially at risk from accidental oil spills, along with the requirement to maintain oil-spill response equipment in those areas. An oil spill could alter land use temporarily but would not likely result in long-term changes. The magnitude of the impacts would depend on the size and location of the spill; the greatest potential would occur from a large spill in shallow water.

In the mid-Atlantic, the existing industrial/maritime infrastructure in the Hampton Roads area can fulfill the requirements of a support base, as well as boat and helicopter traffic. Given the current level of activity in Hampton Roads, there will be minimal impacts on workforce or land use as a result of exploration activity.

o. Impacts on Tourism and Recreation

In the Gulf of Mexico, routine operations would have limited effects on recreation and tourism, with potential adverse aesthetic impacts to beach recreation and sightseeing balanced by potential positive impacts to diving and recreational fishing. Additional impacts could be caused by an increase in the amount of trash and debris washing to shore. Onshore facilities would most likely be placed in commercially zoned coastal locations and would not impact recreation or tourism. The Proposed Program is not expected to result in adverse impacts to recreation and tourism in this region.

Potential impacts to recreation and tourism resulting from an oil spill would likely include direct impacts (e.g., oil contamination of a beach), access restrictions to a particular area (e.g., no diving or fishing while cleanup is being conducted), and aesthetic impacts. These impacts could persist for several months to a year or more pending cleanup completion and any required habitat restoration. The extent of the impacts would depend on the location and size of the spill and the effectiveness of cleanup operations. While oiled beach sediments are usually easily removed via mechanical means,

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such shoreline activity would effectively close the beach to public use for the duration of cleanup operations. If beach restoration is required (i.e., to restore the proper beach profile), additional time may be required before public access is allowed. Historical evidence pertinent to the effects of major oil spills has indicated that spills may prompt either a seasonal decline in tourist visits and/or tourist movement to other coastal areas in the region.

In Alaska, routine operations would generally have limited effects on tourism and recreation, with potential adverse aesthetic impacts to water-dependent activities such as fishing (in the Arctic Subregion, fishing is primarily a subsistence activity rather than a recreational activity), boating, sightseeing, and associated land-based activities such as hiking, picnicking, camping, and hunting. However, routine operations in the North Aleutian Basin Planning Area could impact recreation and tourism in concentrated areas, since the North Aleutian Basin has not been previously developed for the oil and gas industry. Impacts would be greatest in the initial construction periods due to the limited infrastructure to accommodate both tourists and construction workers in the region (with regards to boat and air traffic and overnight accommodations) and possible restrictions in touring routes and fishing and boating activities. Impacts on recreational activities would depend on the proximity of the new construction to the recreational-use areas. Areas of new industrialization would be concentrated in a few locations, thus minimizing the impact to the overall region. Any closures of areas to water-oriented recreational activities would be only for short periods of time. Changes in visual quality would be expected to be localized and would be concentrated during periods of high industry activity, such as when drilling and laying of pipelines occur.

Potential impacts to recreation and tourism resulting from an oil spill would likely include direct impacts (e.g., oil contamination of a recreation-use area), access restrictions to a particular area (e.g., no diving or fishing while cleanup is being conducted), and aesthetic impacts (e.g., view of spill and cleanup activities). The magnitude of these impacts would depend on factors such as the size and location of the spill and effectiveness of cleanup operations. Impacts would likely be greatest if the spill occurred during the peak recreational season and in shallow waters.

In the mid-Atlantic area, oil and gas activities during exploration may have visual and audible impacts on coastal visitors, particularly if drilling rig and production platform are within 11 miles of the shoreline. Impacts from routine activities are expected to have no noticeable effects on recreation and tourism activity. Routine activities associated with oil and gas exploration, development and production may result in visual, natural, and branding impacts on tourism and recreation. An oil spill could result in temporary beach closures.

p. Impacts on Fisheries

Biological resources that serve as the basis for commercial and recreational fisheries in the Gulf of Mexico are expected to be affected by activities associated with routine operations under the proposed action. These activities include vessel traffic and structure placement, presence, and removal. Turbidity and noise associated with installation and decommission activities (mobile offshore drilling units, pipelines), deposition of cuttings, and drilling activities could temporarily drive fishes away from the area and preclude fishing. Additionally, potential conflicts between exploration activities and fishing gear, bottom trawlers, longliners, and purse netters could also preclude commercial fishing. However, these impacts would be temporary. Once platforms are installed and production activities begin, offshore structures would act as fish attraction devices for both pelagic and reef-associated species; these structures would also be attractive to handline fishers.

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If oil spills were to occur, commercial and recreational fisheries could be affected in several ways. The possibility of oil-soaked fishing gear and potentially contaminated fish may reduce fishing efforts. Individuals of target fish species could be affected directly by exposure to spilled oil, potentially causing fish death or illness. Spills could also indirectly affect fisheries by degrading habitats that are critical for the survival of target species, but would only be serious if they lead to severe declines in target species populations. Highly migratory fish species (tunas, sharks, and billfish) could move away from surface oil spills in deep water, disrupting fishing efforts. The level of effects from accidental oil spills on commercial and recreational fisheries would depend on the location, timing, and volume of spills, in addition to other environmental factors. Small spills are unlikely to have a large effect before dilution and weathering reduces concentrations and, therefore, would not have long-term effects on commercial and recreational fisheries in the Gulf of Mexico. It is anticipated that a large spill would affect only a small proportion of a given fish population within the Gulf of Mexico and that fish resources would not be permanently affected.

Commercial fishing is a major industry in Alaska, especially in the North Aleutian Basin. Routine operations in Alaska, (e.g., vessel traffic, seismic surveys, and structure placement and presence) from the proposed action could have localized and temporary effects on some fishery resources. Commercial and recreational fisheries could be affected by changes in the distribution or abundance of the fishery resource, a reduction in the fish or shellfish catches, preclusion of fishers from access to viable fishing areas, or by causing loss or damage to fishing equipment or vessels. However, overall effects on populations of commercial and recreational fishery resources are not anticipated. Seismic surveys and construction of platforms and pipelines could result in space-use conflicts with commercial fishing activities, although these effects would be localized and, in the case of seismic surveys, temporary. Impacts would be expected to be limited in scope as a result of adherence to mitigation measures and compliance with Federal, State and local requirements.

The level of effects from accidental oil spills on commercial and recreational fisheries would depend on the location, timing, and volume of spills, in addition to other environmental factors. Small spills are unlikely to have a large effect before dilution and weathering reduces concentrations. It is anticipated that any single large spill would affect only a small proportion of a given fish population within Alaska, and that fish resources would not be permanently affected. Substantial temporary effects on populations could occur if important habitat areas were contaminated. Localized effects on commercial and recreational fishing could result as a consequence of reduced catch, contamination of fish tissues, degraded aesthetic values that attract fishers, temporary closure of fishing areas, loss of gear, or loss of fishing opportunities during cleanup and recovery periods. Only a few species with susceptible life histories might show population-level effects if a major spill were to occur when and where a population is concentrated.

In the mid-Atlantic, the minimal level of activity projected for the proposed action will result in no discernible impacts for commercial and recreational fisheries from oil and gas exploration. Impacts on commercial fisheries are not expected to produce losses in fish and shellfish stocks that are measurable against natural variation. Economic losses are expected to be limited to a few fishermen and last less than 1 year. No losses distinguishable from natural variation in recreational fish and shellfish stocks are expected. An oil spill in nearshore waters could reduce or prohibit recreational fishing in the affected area for months or longer.

Section B, below, compares the various alternatives to the proposed action (alternative 1).

B. Alternative 2—Exclude North Aleutian Basin

1. Description

Alternative 2 excludes one sale scheduled for North Aleutian Basin in alternative 1, resulting in 19 sales in the remaining 6 OCS planning areas.

2. Comparison of Impacts

As a result of excluding the North Aleutian Basin Planning Area from the 2007-2012 program, there would be one fewer sale in the Alaska Region. The OCS oil and gas activities associated with this sale would not occur. The small amount of liquid hydrocarbons assumed to be developed in the North Aleutian Basin under alternative 1 would be replaced with increased domestic production elsewhere or by increased imports. The small amount of liquid hydrocarbons involved would not affect the potential of import tanker spills versus OCS spills.

Alternative 2 would result in no impacts to resources analyzed in the EIS that are found within the North Aleutian Planning Area. Potential impacts to ESA-listed species (e.g., Steller sea lions, North Pacific right whales, Steller's and spectacled eiders) from OCS activities would be nonexistent because no activity would occur within this planning area. This alternative would also eliminate any conflicts between OCS activities and commercial fisheries in this planning area.

In the Gulf of Mexico and mid-Atlantic, the impacts would be the same as for alternative 1. In the Beaufort Sea, Chukchi Sea, and Cook Inlet, the impacts would be the same with the possible exception of the Steller's eider and Steller's sea lion, which travel from the North Aleutian Basin area to these other planning areas during the course of the year. Under alternative 2 since there would be no potential for impact to these species in the North Aleutian Basin, the populations in other planning areas would not be affected either by OCS activities in the North Aleutian Basin.

C. Alternative 3—Exclude Cook Inlet

1. Description

Under alternative 3, no sales would be held in the Cook Inlet Planning Area, resulting in 18 sales in the 2007-2012 program.

2. Comparison of Impacts

Under alternative 3, no oil or gas would be produced from the Cook Inlet Planning Area. The small amount of liquid hydrocarbons assumed to be developed in Cook Inlet under alternative 1 would be replaced with increased domestic production elsewhere or by increased imports. The small amount of liquid hydrocarbons involved would not affect the frequency of import tanker spills versus OCS spills. Alternative 3 would not affect the schedule of sales in other planning areas nor the assumed amount of activity likely to occur in those areas.

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Alternative 3 would result in the elimination of impacts for those species found primarily within the Cook Inlet (e.g. Cook Inlet stock of beluga whales). Effects would also be reduced for those species that migrate through the Cook Inlet (e.g., Steller's eider, short-tailed albatross, and the Kittlitz's murrelets).

Because of the small amount of OCS activity assumed to occur in Cook Inlet under alternative 1, impacts to other resources are expected to be localized and short-term. The potential for the occurrence of these impacts would be eliminated under alternative 3.

D. Alternative 4—Exclude Mid-Atlantic

1. Description

Under alternative 4, no sale would be held in the Mid-Atlantic Planning Area, resulting in 19 sales in the 2007-2012 program. The schedule of leasing and assumed amounts of OCS activity would be unchanged in all other planning areas. This will require discontinuation of the Congressional moratorium and modification of the 1998 Presidential withdrawal.

2. Comparison of Impacts

Only a small amount of activity and production was estimated to occur in the mid-Atlantic under alternative 1 resulting in some potential small, incremental, short-term and localized impacts in a diversified economic region already supporting a large maritime industry. No population-level impacts to biologic resources are likely to occur under alternative 4. A service vessel or barge/tanker collision with the endangered right whale could affect the population of these whales, which is estimated to number only between 300 and 350 animals. Such an accident is unlikely though, given the small amount of activity expected to occur in the area estimated at one to five service vessel trips per week. Alternative 4 would preclude this possibility of collision.

In the Gulf of Mexico, Beaufort Sea, Chukchi Sea, North Aleutian Basin, and Cook Inlet, the impacts would be the same as for alternative 1.

E. Alternative 5—Defer Blocks Within 25 Miles of the Virginia and Chukchi Sea Coasts

1. Description

This alternative considers the impacts associated with not leasing within 25 miles of the Virginia and Chukchi Sea coasts. The alternative would affect the locations within a planning area that are available for leasing, not the schedule of lease sales.

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Alternative 5 would affect the impacts from sales in:

- Chukchi Sea (Alaska) - 3 lease sales scheduled in 2007, 2010, and 2012
- Mid-Atlantic (Virginia) - 1 sale in 2011, which is subject to restrictions

Sale-related activities identified for the proposed action (alternative 1) would have a reduced impact to shore and nearshore communities under this 25-mile buffer alternative. Offshore infrastructure such as rigs and platforms would not be placed in this buffer area, essentially eliminating potential for visual impacts from shore. Coastal water quality effects from discharge of drilling fluids and air and noise emissions from platforms would be partially reduced.

2. Comparison of Impacts

Chukchi Sea: This alternative would eliminate most potential environmental impacts to resources within the 25-mile buffer zone in the Chukchi Sea from routine operations, such as water and gaseous discharges, bottom disturbances, and seismic. The potential for impacts to coastal water quality, coastal air quality, marine mammals, marine and coastal birds, benthic communities, subsistence, and fish resources would be reduced. However, the potential for impacts from vessel traffic, aircraft, offshore and onshore pipeline construction, and onshore support facilities would still exist. There would be no gravel island or ice roads constructed in the Chukchi Sea under this alternative, thus eliminating potential impacts arising from these facilities. The potential for offshore impacts to polar bears would be reduced by virtue of reducing the likelihood of their interactions with OCS structures and activities, including seismic. Potential impacts to polar bears onshore would be unchanged from alternative 1. The 25-mile buffer provides additional protection from potential impacts to the bowhead whales during their spring migration because there would be no OCS infrastructure or activity in the migration area, which is limited to within 25 miles of the coast.

The potential for adverse coastal and nearshore impacts from oil spills that occur at offshore facilities would be reduced compared with alternative 1. Oil spills could still occur during transportation in or near the coast. This alternative would also reduce potential effects of a large oil spill on portions of Chukchi Sea Unit of the Alaska Maritime National Wildlife Refuge. The establishment of a 25-mile buffer would reduce potential impacts on Native subsistence because subsistence hunting activities occur within the deferral area. Possible adverse health or environmental impacts from changes in subsistence resources and harvest patterns would be reduced. A reduction in the likelihood of a nearshore oil spill at an OCS facility slightly reduces the chances of potential oil-spill impacts on Native subsistence resources and harvests.

The impacts to terrestrial animals, coastal habitats, land use and existing infrastructure, population, employment, regional income, tourism, and recreation would be essentially the same as those for the proposed action since the need for onshore support facilities and pipelines would not change.

Mid-Atlantic: This alternative reduces potential environmental impacts to the resources that are located within the 25-mile buffer zone off the Virginia coast. The potential for impacts to these resources from most routine OCS operations (e.g., liquid and gaseous discharges, bottom disturbances, and seismic) is eliminated. Impacts from vessel traffic, aircraft, offshore and onshore pipeline construction, and onshore support facilities would remain the same as alternative 1. There still would be a risk of collisions between vessels and marine mammals, including the right whale. A reduction in the chance of a nearshore oil spill from a platform would also reduce possible longer term adverse effects on tourism. However, a risk of a large spill from tanker transport of oil would still exist. The

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25-mile buffer would eliminate the potential for viewshed impacts from the coast because no OCS facilities would be visible at a distance of 25 miles or more offshore.

The impacts to terrestrial animals, coastal habitats, land use and existing infrastructure, population, employment, and regional income, would be essentially the same as those for Alternative 1 since the need for onshore support facilities and pipelines would not change.

F. Alternative 6—Defer Blocks at the Mouth of the Chesapeake Bay

1. Description

The alternative would affect the locations within a planning area that are available for leasing, not the schedule of lease sales. Alternative 6 would affect the impacts from one sale in the Mid-Atlantic Planning Area (Virginia). Under alternative 6, the area offered in the Mid-Atlantic Planning Area would be reduced by eliminating the lease blocks within a wedge-shaped area offshore the entrance to the Chesapeake Bay. There would be no changes to the schedule of sales or the expected amounts of OCS activity in the remaining OCS sale areas. The MMS geologic information (MMS, 2001h), indicates that the deletion of these lease blocks would not significantly change the resource estimates or the development scenario for the mid-Atlantic sale area..

2. Comparison of Impacts

This alternative would affect impact levels only within the mid-Atlantic sale area. In all other OCS areas, there would be no change from the impacts described for alternative 1. Because it is assumed that the deletion of the wedge-shaped area offshore the entrance to the Chesapeake Bay would not significantly change the development scenario for the mid-Atlantic sale area described under alternative 1, the potential impacts described for alternative 1 would also remain unchanged under alternative 6, with one minor exception. The low potential for direct physical impacts to archaeological resources from exploration and development activities under alternative 1 would be reduced even further under this alternative because the entrance to the Chesapeake is considered an area with high potential for the occurrence of historic and prehistoric cultural resources.

G. Alternative 7—Limit Leasing in the North Aleutian Basin Planning Area to Blocks Offered in Lease Sale 92

1. Description

This alternative affects the location within the North Aleutian Basin Planning Area that would be available for leasing. There would still be one sale scheduled in the North Aleutian Basin.

Under alternative 7, the area offered for leasing in the North Aleutian Basin would be reduced to 990 blocks (approximately 2.27 million hectares) forming a wedge-shaped area that ranges from 18 to about 185 km offshore of the Alaska Peninsula, the same area proposed for the earlier North Aleutian Basin Sale 92. The analysis of this alternative assumes that the amount of OCS activity and developed hydrocarbons would not be significantly different from those under alternative 1 based on geologic

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information indicating the areas available for leasing under this alternative is the area of highest hydrocarbon potential.

2. Comparison of Impacts

This alternative reduces the area offered in the North Aleutian Basin lease sale to 990 blocks. However, it includes the geographic area in which program-related offshore oil and gas activities were projected to occur under the alternative 1 development scenario. Therefore, it is not expected to substantially affect the impact levels that would occur under alternative 1.

H. Alternative 8—Defer Blocks in the Beaufort Sea Planning Area to Avoid Conflicts with Whaling

1. Description

The alternative affects the locations within the Beaufort Sea Planning Area that are available for leasing in two lease sales scheduled for 2009 and 2011

This alternative is based on two alternatives that were included in the Beaufort Sea Planning Area EIS to protect subsistence hunting (MMS, 2003a). These alternatives are:

- The Barrow Subsistence Whaling Deferral that defers 26 whole or partial blocks located at the western border of the planning area
- The Kaktovik Subsistence Whaling Deferral that defers 28 whole or partial blocks located offshore of Kaktovik.

The analyses use the same Arctic exploration and development scenario used in alternative 1 because of the relatively small number of blocks (54) involved compared to the total number of blocks still available for leasing.

2. Comparison of Impacts

The primary effect of this alternative would be on subsistence hunting. The lease blocks included in the alternatives were selected based on information from the Alaska Eskimo Whaling Commission and from the subsistence whaling community. This alternative would largely eliminate impacts from routine operations in areas known to be important for subsistence hunting. Subsistence hunting and the hunted animals would remain susceptible to affects from an oil spill or other discharges that affect water and/or air quality occurring in blocks outside the deferral areas.

I. Alternative 9—Defer Blocks Within 50 Miles of Virginia with Other Possible Restrictions

1. Description

The alternative would affect the locations within a planning area that are available for leasing, not the schedule of lease sales. Alternative 9 would affect the impacts from the one sale in the Mid-Atlantic Planning Area.

This alternative restricts leasing to an area beyond 50 miles from the Virginia coastline. This restriction also includes the elimination of lease blocks that extend beyond 50 miles within a wedge-shaped area offshore the entrance to the Chesapeake Bay, as described in alternative 6. Alternative 9 could include restrictions that would allow leasing for exploration-only and/or gas-only activities. Neither gas-only nor exploration-only leasing is currently allowed by the Outer Continental Shelf Lands Act (OCSLA). Congress would have to modify the OCSLA before these options could be implemented. To cover the different possibilities under which this alternative could be implemented, the FEIS analyzes three scenarios: (1) oil and gas leasing beyond 50 miles, (2) exploration-only leasing beyond 50 miles, and (3) gas-only exploration and development beyond 50 miles.

The “oil and gas leasing” scenario assumes the same level of exploration and development activity that was used in alternative 1. This assumption is based on available geologic data indicating that the greatest hydrocarbon potential is located at a distance offshore. Therefore the leasing restriction would not reduce the area of industry interest nearly as much as it would reduce the area available for leasing. Under the “exploration-only leasing” scenario, no development activity would occur. The EIS assumes a reduced amount of exploration activity compared to alternative 1 in addition to the elimination of development activity because of potential industry reluctance to invest in an exploration-only lease. The risk of an oil spill is limited to an accident, such as a blowout, at an exploration well. While modern drilling technology makes this occurrence unlikely the EIS evaluates impacts of a large oil spill at an offshore structure. Under the “gas-only exploration and development” scenario, the likelihood of oil-spill occurrence is reduced. While an oil spill could occur at a gas well, it would be an unlikely event. The EIS assumes that levels of exploration and development activities would be slightly reduced compared to alternatives that allowed for oil development because the geologic information suggests that the area is more likely to contain commercial gas than oil.

2. Comparison of Impacts

a. Oil and Gas Leasing Beyond 50 Miles

Coastal visual impacts from offshore structures would not occur. Impacts to coastal and onshore resources from a contact with oil from a platform spill would not occur because of the 50-mile coastal buffer. There would be no measurable OCS-related coastal air quality impacts. Because of the long travel times to offshore facilities located 50 or more miles offshore, we assume more use of helicopters for fast transport. Service vessels would be used for bulk products. A reduction in service vessel traffic would reduce the already slight chances of collision between an offshore vessel and a marine mammal or reptile. For these reasons, alternative 9 reduces the likelihood of some impacts compared to alternative 1.

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b. Exploration-Only Leasing Beyond 50 Miles

The EIS assumes a reduction in the number of exploration wells compared to alternative 1 because of reduced industry interest with the exploration-only restriction. There would be no pipeline impacts, nor construction of onshore facilities. For analysis purposes we assume the occurrence of a large oil spill at the offshore well site. Such an event is unlikely but was included to evaluate the results should it occur. Because of reduced exploration activities and no development activities, impacts to the local infrastructure, economy, and sociocultural systems would be reduced. The EIS assumes that industry would outsource much of the offshore work and utilize available onshore infrastructure to operate from.

c. Gas-Only Leasing Beyond 50 Miles

The EIS assumes a small reduction in the number of exploration and development wells compared to alternative 1 as a result of this restriction because the area is assumed to be gas prone. Under the gas-only assumption, no oil spill would occur from a tanker during transportation. The environmental impacts of exploration drilling were included in scenario 2. This scenario introduces development activity that includes an offshore production platform, a gas pipeline, and onshore facilities. Coastal impacts from gas pipeline accidents would be less than coastal impacts from an oil tanker/barge spill, which could occur under the oil leasing alternative. The EIS assumes for analysis purposes the occurrence of a large oil spill at a gas platform located more than 50 miles from the coastline. This spill, although very unlikely, could result from loss of well control while drilling through oil or condensate bearing strata. The occurrence of a spill would be even more unlikely if a “dry-gas only” restriction was included in the leases.

J. Alternative 10—No Action

The evaluation of a "no-action" alternative is required by the regulations implementing the National Environmental Policy Act (NEPA) (40 CFR 1502.14(d)). If the Secretary were to adopt this alternative, it would halt OCS presale planning, sales, and new leasing from 2007 to 2012 even in the Central and Western Gulf of Mexico Planning Areas. However, exploration, development, and production stemming from past sales would continue.

This alternative would shut down the OCS leasing program from mid-2007 through mid-2012. The amounts of OCS natural gas (up to 30 trillion cubic feet) and oil (up to 7.5 billion barrels of oil) required to meet national energy needs would be forgone. That amount of energy would have to be replaced by a combination of imports, alternative energy sources, and conservation.

Market forces are expected to be the most important determinant of the substitute mix for OCS oil and gas (see Section IV.F.2). Key market substitutes for forgone OCS oil production would be imported oil (88%), conservation (5%), switching to gas (4%), and onshore production (3%). For OCS natural gas, the principal substitutes would be switching to oil (40%), onshore production (28%), imports (16%), and conservation (16%).

In addition to market-based substitutes, the Nation or individual States might choose to encourage or even impose programs designed to deal with the energy shortfall. To replace oil, these programs might favor alternative vehicle fuels such as ethanol or methanol, vehicles with greater fuel efficiency, or alternate transportation methods such as mass transit.

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As a partial replacement for the forgone natural gas, governments might mandate increased reliance on coal, nuclear, hydroelectric, or wind-generated electric power. In addition, governments might give more emphasis to programs encouraging more efficient electricity transmission and more efficient use of gas and electricity in factories, offices, and homes.

K. Comparison of the Alternatives

Alternative 1—Proposed Action

Air Quality: Air emissions from routine operations are well within national standards for all Regions. Oil spills and in situ burning could have localized and short-term effects.

Water Quality: Compliance with NPDES permits would minimize impacts to receiving waters in all regions. Impacts from a large coastal oil spill could persist for an extended period of time if oil were deposited in wetland and beach sediments or collected in low-energy coastal environments where resuspension could affect water quality.

Marine Mammals: Noise from seismic activity and routine operations could disturb individual animals. Collisions with service vessels could result in mortality, but MMS guidelines and regulation should minimize collisions. Although unlikely, a large spill that contacts Steller sea lion or North Pacific right whale critical habitat in the North Aleutian Basin could have population-level impacts. In the Atlantic, the endangered right whale could experience population-level impacts from collision mortality.

Marine and Coastal Birds: Routine operations would disturb birds in the immediate vicinity of activity due to noise and construction activities. Large spills near the coast would impact birds through direct contact as well as from contaminated food and nesting areas. Although unlikely, a large spill contacting Steller's eiders during the winter in the North Aleutian Basin could result in population-level impacts and could affect populations in the Arctic area.

Terrestrial Mammals: Construction and operation of onshore facilities and pipelines could result in short- and long-term impacts from disturbances and loss of habitat. While direct impacts would be short-term and localized, stress could affect reproductive success resulting in longer term impacts to populations. Impacts from oil spills could affect individual mammals but not overall population levels. In the Gulf of Mexico, population-level impacts to endangered beach mice and voles from routine operations are not expected. Beach mice are unlikely to be contacted by oil spills because of habitat location on inner dunes.

Fish Resources and EFH: Some short-term and localized impacts could occur from routine activities, such as seismic surveys, offshore construction, and drilling discharges in the vicinity of the activity. Population-level impacts to most fish species from routine operations or oil spills are not expected. Large spills that reach coastal wetlands could have persistent impacts on EFH and could require remediation. In the Gulf of Mexico, impacts to Gulf Sturgeon would be minimal because of little overlap between sturgeon occurrence and areas for the proposed activities. In Alaska, a large spill that reaches coastal streams and intertidal areas used for spawning by anadromous salmon could have more persistent impacts and require remediation.

Sea Turtles: Impacts to individual turtles could occur from seismic activity, operational discharges, platform removals, or collisions with service vessels, but no population-level impacts are expected.

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Oil spills could affect turtles at all life stages by direct contact or deterioration of their preferred habitat. Onshore structures may also potentially affect sea turtle nesting sites.

Coastal Habitats: Onshore construction of facilities and pipelines, and service vessel traffic could affect coastal wetlands and barrier beaches through direct losses, accelerated erosion, and indirect effects associated with hydrologic changes and water quality impacts. Oil spills and cleanup operations could result in habitat loss from dieback of vegetation and damage from cleanup operations. Direct and indirect impacts to barrier beaches and dunes could occur from pipeline construction and vessel traffic.

Seafloor Habitats: In the Gulf of Mexico, physical impacts to topographic features, pinnacles, and chemosynthetic communities from pipeline and platform emplacements and oil spills will be minimized by existing MMS lease stipulations that prohibit all or some activities near the features. In Alaska, the Stefansson Boulder Patch communities in the Arctic would be vulnerable to impacts from routine operations and oil spills, but planning procedures, lease stipulations, and regulations should minimize or eliminate these potential impacts.

Areas of Special Concern: Routine operations should not result in impacts to national parks, wildlife refuges, and national estuary program sites because development in these areas is restricted. A large, nearshore oil spill could contact coastal refuges and impact coastal habitats.

Population, Employment, and Regional Income: Employment and regional income impacts would be greatest in Texas and Louisiana. Added employment demands are not expected to tax the local labor market. A coastal oil spill could result in a one-time seasonal decline in tourism-related business activity along the Gulf Coast. In Alaska, a large oil spill could result in noticeable impacts through damage to various industries such as commercial fisheries. Frontier areas might experience some immigration of labor to fill oil and gas exploration and development jobs because the local labor market does not specialize in these skills.

Sociocultural Systems: In the Gulf of Mexico, the greatest impacts would occur from the ongoing expansion of deepwater activities that result in longer unbroken periods of offshore work and immigration of part of the workforce. In Alaska, the largest impacts would occur from oil spills that could affect subsistence hunting and activities.

Environmental Justice: In the Gulf of Mexico, coastal infrastructure use and construction levels would be similar to previous programs. In Alaska, new onshore infrastructure located near Native populations could produce adverse health or environmental impacts if there were impacts on subsistence resources and harvest patterns. Oil-spill environmental impacts on Alaska Native populations could be disproportionately high or adverse depending on the geographical location of the spill and the effects on subsistence resources and harvests.

Archaeology: Adherence to existing Federal, State, and local regulations and policies will protect most archaeological resources from impacts from routine operations. Impacts could occur to coastal historic and prehistoric archaeological resources from accidental oil spills. Limited impacts are expected directly from the spill, but some impacts could occur during cleanup operations

Land Use and Infrastructure: New facilities are expected to be constructed along the central and western Gulf of Mexico in areas already affected by decades of offshore oil and gas development. In Alaska, the greatest potential impact would be to expose undeveloped areas to OCS-related onshore construction. Oil spills could result in temporary land-use changes.

Tourism and Recreation: In the Gulf of Mexico, routine operations would have limited effects, with potential adverse aesthetic impacts to beach recreation and sightseeing and potential positive impacts

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for diving and recreational fishing. In Alaska, routine operations could have limited effects, particularly in previously undeveloped oil and gas areas where there is limited infrastructure to accommodate both tourists and construction workers. Oil spills would affect tourism and recreation temporarily. In the Atlantic, some visual and branding impacts on tourism could occur. An oil spill could result in temporary beach closings.

Fisheries: In the Gulf of Mexico, some short-term and localized impacts to recreational and commercial fisheries from routine operations could occur. An oil spill could temporarily affect recreational and commercial fishing in areas contacted by the spill. Commercial and subsistence fishing are major activities in both the Cook Inlet and the North Aleutians Basin, and local and short-term effects from routine operations and oil spills could occur in these areas. Because of the small amount of activity expected offshore Virginia, no long-term impacts to fisheries from routine operations are expected to occur.

Alternative 2—Exclude North Aleutian Basin

Impacts to all resources in the North Aleutian Basin would be eliminated. However, the Steller's eider and Steller's sea lion travel from the North Aleutian Basin to other planning areas during the course of the year, where impacts could occur. This alternative would also eliminate any conflicts between OCS activities and commercial fisheries in the North Aleutian Basin.

Alternative 3—Exclude Cook Inlet

Impacts would be reduced, but not eliminated, for all resources analyzed within the Cook Inlet. Effects would also be reduced for those species found primarily within the Cook Inlet (e.g. Cook Inlet stock of beluga whales) and for those species that migrate through the Cook Inlet (e.g., Steller's eider, short-tailed albatross, and the Kittlitz's murrelets).

Alternative 4—Exclude Mid-Atlantic

Impacts from OCS activities would be eliminated for all resources in the mid-Atlantic.

Alternative 5—Defer Blocks Within 25 Miles of Virginia and Chukchi Sea Coasts

In the Chukchi Sea, most potential environmental impacts from routine operations to resources within the 25-mile buffer zone would be eliminated or reduced. Additional protection from potential impacts to the bowhead whales during their spring migration would be provided, as well as some added protection for polar bears. The potential for adverse coastal and nearshore impacts from oil spills would be reduced.

In the Mid-Atlantic Planning Area, most potential environmental impacts to resources located within the 25-mile buffer zone off the Virginia coast would be eliminated. A reduced risk of nearshore oil-spill effects on coastal resources, including tourism, would be expected. Viewshed impacts from the coast would be eliminated.

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Alternative 6—Defer Blocks at the Mouth of the Chesapeake Bay

Deferral of this area would reduce the potential impacts to historic and prehistoric cultural resources (e.g., shipwrecks).

Alternative 7—Limit Leasing in the North Aleutian Basin Planning Area to Blocks Offered in Lease Sale 92

The slight risk of adverse impacts to the Steller sea lion and Steller's eider would be reduced still further by limiting oil-related activity to the southern portion of the planning area.

Alternative 8—Defer Blocks in the Beaufort Sea Planning Area to Avoid Conflicts with Whaling

Impacts from routine operations in areas known to be important for subsistence hunting would be eliminated.

Alternative 9—Defer Blocks Within 50 Miles of Virginia with Other Possible Restrictions

In addition to effects listed above under alternative 5, deferring blocks out to 50 miles would reduce the already small risk of collisions between vessels and marine mammals, including the right whale.

Alternative 10—No Action

Under the No Action alternative, none of the environmental impacts associated with the proposed action would occur. The amounts of OCS natural gas (up to 30 trillion cubic feet) and oil (up to 7.5 billion barrels of oil) required to meet national energy needs would be forgone. That amount of energy would have to be replaced by a combination of imports, alternative energy sources, and conservation. The increase in imports would lead to an increased risk of spills from tankers.

Preferred Alternative

The MMS has developed a "preferred alternative" consistent with NEPA regulations Section 1502.14. The preferred alternative is a combination of the several alternatives analyzed in this document. As such, it differs from the proposed action (alternative 1).

The preferred alternative combines the several subarea deferrals into the 2007-2012 program. This includes the subarea deferrals for the Atlantic, the North Aleutian Basin, the Chukchi Sea, and the Beaufort Sea as described in alternatives 5, 6, 7, 8, and 9. Thus, all subarea deferrals identified and analyzed as alternatives in this FEIS are part of the "preferred alternative". If this approach is adopted, all these deferral areas would be removed from any further consideration for leasing during this 2007-2012 program. The environmental benefits of alternatives 5, 6, 7, 8, and 9 would all be realized with the adoption of the preferred alternative. These benefits primarily include reduced risks to environmental resources in coastal areas and to subsistence hunting activities in the Arctic.

This preferred alternative is consistent with MMS's statutory mission and responsibilities giving consideration to economic, environmental, technical and other factors. Under the OCSLA, the

II. Alternatives

Secretary of the Interior must consider specific principles and factors in formulating the 2007-2012 program. These include national energy needs; equitable sharing of developmental benefits and environmental risk; other uses of the sea and seabed; interest of potential oil and gas producers; environmental sensitivity and marine productivity; and the laws, goals and policies of affected States. The preferred alternative represents a reasonable balance between the development of available hydrocarbon resources and the protection of the environment.