

## SUMMARY

### INTRODUCTION

In many parts of the United States, National Forest System lands overlie geologic formations that contain oil or natural gas. "Leases" are offered under the mineral leasing laws for many of the lands for the purpose of drilling exploratory wells and extracting oil and/or gas. The mission of the Forest Service in relation to minerals management is to support, facilitate, and administer the orderly exploration, development, and production of mineral and energy resources on National Forest System lands to help meet the present and future energy needs of the Nation.

The Forest Service (Uinta and Ashley National Forests) and the Bureau of Land Management (BLM) are conducting an environmental analysis with the intent of identifying Federal lands with Federal mineral rights that should or should not be made available for oil and gas exploration, development, and production within a study area comprised of portions of the Uinta and Ashley National Forests. In accordance with the National Environmental Policy Act of 1969 (NEPA), the Forest Service, as custodian of surface uses on National Forest System lands, in cooperation with the BLM, manager of subsurface minerals, is responsible for identifying and assessing potentially significant environmental impacts and addressing issues associated with oil and gas activities.

The environmental impact statement (EIS) describes and explains the leasing decisions the Forest Service and BLM will make, how the Forest Supervisors and the State Director (Utah) of the BLM will implement the decisions, and how future decisions will be made to issue permits to drill and potentially develop field of oil and gas.

**Proposed Action** The Forest Service proposes to make most of the National Forest System lands in the study area available for oil and gas leasing. The BLM proposes to offer for lease all lands that are authorized by the Forest Service. The Forest Service and BLM propose the following specific actions.

- 1) The Forest Supervisor of the Uinta and Ashley National Forests will decide, within the study area, which National Forest System lands and non-Federal lands with Federal mineral Ownership (split estate lands) are administratively available for oil and gas leasing and under what conditions (lease stipulations).

2) The Forest Supervisors will decide what specific National Forest System lands the BLM is authorized to offer for lease, subject to the Forest Service ensuring that correct stipulations will be attached to leases issued by the BLM.

3) The Forest Service proposes to amend the Uinta and Ashley National Forest Land and Resource Management Plans (Forest Plans) to incorporate the leasing decision in place of the leasing matrix (in the Forest Plans) and other site-specific changes as indicated in the analysis.

4) The BLM will decide whether or not to offer for lease the specific lands authorized by the Forest Service.

The decisions made as a result of this analysis will not result in ground-disturbing activities, such as exploration, drilling, and/or field development which would require further environmental analysis prior to approval.

**Relationship to the Forest Plans** Management of each administrative unit of the National Forest System (one or more National Forest(s) or National Grassland(s) is governed by a Land and Resource Management Plan (Forest Plan). Most of the existing Forest Plans include general decisions, as part of management prescriptions, to provide for oil and gas leasing, but do not include decisions for leasing specific lands. Prior to the passage of the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (Leasing Reform Act) and except for acquired lands, the Forest Service had no authority to make decisions related to issuing or not issuing oil and gas leases on National Forest System lands. The Forest Plan EISs, which predate the Leasing Reform Act, do not fully meet the intent of the regulations to make site-specific leasing decisions. Decisions the Forest Supervisors will make, including availability, will be used to develop an amendment to the Forest Plans.

**Reasonably Foreseeable Development** Activity that occurs after a lease is issued can create economic, environmental, and social impacts. A reasonably foreseeable development (RFD) scenario was developed for each Forest and used to estimate effects of exploration, development, and production activity. It was developed using historical oil and gas development information, other known geologic information, and interpretation of the information by the Forest Service geologists. The purpose of the RFD is to provide a basis for analysis and estimating environmental effects. It must be recognized that future exploration and development may not occur exactly where predicted in the RFD scenario presented in the EIS.

The projected level of oil and gas industry activity in the Western Uinta Basin study area over the next 10 to 15 year period is 6 exploratory wells and 30 development wells. Development activity is projected to occur in the Sowers Canyon area in the Ashley National Forest. This area has proven gas production from the Green River Formation with estimated gas reserves of 100 billion cubic feet. Nearly all of the lands are currently held under active oil and gas leases. Five existing shut-in wells are located in this area and a pipeline has been installed in association with activities occurring north of the study area. Five exploration wells are predicted to be located in the Ashley National Forest (outside of the Sowers Canyon area), and one exploration well is predicted to be located in the Uinta National Forest portion of the study area.

**Federal Management of Leases and Associated Development** The BLM is responsible for issuing oil and gas leases on Federal lands and on private lands for which the Federal government retains mineral rights. The BLM cannot issue leases for lands administered by the Forest Service without consent from the Secretary of Agriculture. In areas where exploration and development of oil and gas resources would conflict with the protection or management of other resources or public uses, the NEPA process identifies measures to mitigate impacts. Such mitigation measures may occur on oil and gas leases as either stipulations to uses or as restrictions on surface occupancy.

## **ALTERNATIVES**

Early in the project, comments were solicited from relevant agencies and the general public. The comments received were analyzed and summarized to represent the issues and concerns of the respondents. Based on and in response to the issues, the Forests developed a range of alternatives that meet the purpose of and the need for the project. The alternatives propose specific actions that could be implemented: (1) to decide which lands would or would not be administratively available and if available, under what stipulations, and (2) decide which lands the BLM would be authorized to lease.

Thirteen issues were identified during scoping - the effects of oil and gas leasing and possible subsequent exploration and development activities on:

1. Socioeconomic conditions
2. Wildlife
3. Recreational opportunities

4. Air and water resources
5. Visual resources
6. Oil and gas exploration and development, due to restrictive stipulations and mitigation measures
7. Soils and geologic formations
8. Transportation
9. Threatened, endangered, and sensitive species
10. Vegetation
11. Inventoried roadless areas
12. Research natural areas
13. Other mineral development and exploration

The alternatives were developed in response to these issues and to ensure that a full range of leasing options were addressed for each specific resource area. Alternatives considered in detail include:

**Alternative 1 (No Action/No Lease)** Federal minerals within the analysis area would not be administratively available for oil and gas leasing. Therefore, there would be no leasing decision for specific lands. Existing leases would remain in effect until they terminate or expire and the decision would not involve private minerals.

The reasonably foreseeable development scenario under this alternative would consist of:

- No exploratory drilling on the Uinta NF
- One exploratory well would be drilled on the Ashley NF outside the Sowers Canyon area
- Twelve development wells would be drilled and produced on existing leases within the Sowers Canyon area of the Ashley NF

**Alternative 2 (Forest Plans Modification No. 1)** This alternative is designed to be more restrictive than the current Forest Plans and provides for additional protection for special resource values other than oil and gas. Selection of this alternative would require amendment of the Forest Plans to reflect the stipulations required by this alternative. All areas of federal minerals would be administratively available for leasing and would be leased with the protective lease stipulations presented by resource component in Table S-1.

The reasonably foreseeable development sceneario under this alternative would consist of:

- One exploratory well would be drilled on the Uinta NF
- Two exploratory wells would be drilled on the Ashley NF outside of the Sowers Canyon area
- Twenty development wells would be drilled and produced on leases within the Sowers Canyon area of the Ashley NF

**Alternative 3 (Forest Plans Intent)** This alterative is designed to reflect the management direction contained in the current Forest Plans. No amendments to the Forest Plans would be needed should this alternative be chosen.

Under this alternative all federal minerals within the analysis area would be administratively available for leasing, and would be leased with the protective lease stipulations presented in Table S-1.

The reasonably foreseeable development sceneario under this alternative would consist of:

- One exploratory well on the Uinta NF
- Three exploratory wells would be drilled on the Ashley NF outside the Sowers Canyon area
- Twenty-seven development wells would be drilled and produced on leases within the Sowers Canyon area of the Ashley NF

**Alternative 4 (Forest Plans Modification No. 2)** This alternative is designed to be less restrictive than the current Forest Plans in terms of oil and gas development while providing protection to other resource values. The Forest Plans would be amended to reflect the stipulations required by this alternative, if chosen.

Under this alternative federal minerals within the analysis area would be administratively available for leasing and would be leased with the protective lease stipulations presented in Table S-1.

The reasonably foreseeable development sceneario under this alternative would consist of:

- One exploratory well would be drilled on the Uinta NF
- Five exploratory wells would be drilled on the Ashley NF outside of the Sowers Canyon area
- Thirty development wells would be drilled and produced on leases within the Sowers Canyon area of the Ashley NF

**Alternative 5 (Standard Lease Terms)** This alternative would be the least restrictive of the five in terms of oil and gas development. Under this alternative all federal minerals within the analysis area would be administratively available for leasing and would be leased with Standard Lease Terms (no special stipulations). Mitigation of impacts on other resources would be based on existing laws and their implementing regulations. Mitigation for resources not protected by law would be based on the Standard Lease Terms and 43 CFR 3101.1-2. Forty three CFR 3101.1-2 provides clarification of “reasonable mitigation measures” as used in Section 6 of the Standard Lease Terms form (BLM Form 3100-11); the specific measures are the authority to delay activities for up to 60 days, or to move a well location up to 200 meters. The Forest Plans would be amended if this alternative were chosen.

The reasonably foreseeable development scenario for this alternative would be the same as described for Alternative 4 above.

## **AFFECTED ENVIRONMENT**

The area involved in this analysis process is approximately 401,000 acres of adjacent portions of the Uinta NF and Ashley NF in east-central Utah (Figure S-1). The study area encompasses lands with high and moderate potential for oil and gas occurrence located on the south unit of the Duchesne Ranger District of the Ashley NF, and a portion of the Uinta NF’s Heber and Spanish Fork Ranger Districts south and west of Strawberry Reservoir. Of the 401,000 acres of National Forest System (NFS) lands, approximately 204,000 acres are within the Ashley NF and 197,000 acres are within the Uinta NF.

The study area occupies portions of Duchesne, Wasatch, and Utah counties. Ownership within the study area is predominately federal; inholdings with the NFS lands total several thousand acres. Nearby rural communities include Duchesne, Fruitland, Soldier Summit, and Wallsburg. Other

communities and approximate distances are Heber City located 15 miles to the northwest, Provo located 30 miles to the west, Salt Lake City located 80 miles to the northwest, and Vernal located 80 miles to the northeast. Strawberry Reservoir is adjacent to the study area and Starvation Reservoir is located approximately 20 miles to the north. The Uintah and Ouray Indian Reservation borders the NFS lands and the study area to the north.

There are approximately 57,000 acres of lands in the Strawberry Basin, known as the Strawberry Lands, that were purchased by the Bureau of Reclamation and are administered by the Uinta NF. The leasing authority for oil and gas resides with private entities; therefore, no leasing decision will be made for these lands.

The study area occupies portions of the Tavaputs Plateau (Book Cliffs-Roan Plateau) of the Colorado Plateau province and the adjacent Wasatch Hinterlands subsection of the Middle Rocky Mountains province. The dividing line between the two provinces is roughly defined by the southwest-northeast trending Willow Creek Ridge and eastern drainage divide for Tie Fork Creek. Principal geomorphic features/landforms of the study area include:

- Mountain/hill crests, ridges, and sideslopes
- High ridges at the edge of plateau surfaces
- Plateau surfaces
- Canyon/valley sideslopes
- Canyon/valley bottoms

Steep slopes (slopes greater than 35 percent), which can exacerbate potentials for slope failure and accelerated erosion occupy approximately 154,000 acres (38 percent) of the approximately 401,000 acre study area. Soils forming on these landforms reflect the complexity of the geomorphic, geologic, and biological conditions; climatic conditions, including precipitation and temperature, as influences by elevation, aspect, and slope; and man's activities, including clearing, livestock grazing, and timber harvesting. Textures range from loamy skeletal to fine; depths range from deep to shallow; and slopes range from nearly level to more than 70 percent. Areas of limited reclamation potential, approximately 8,700 acres (2 percent) of the study area, include those areas at or above timber line (cold, shallow soils, dessication); those occupied by apparently phytotoxic soils derived from shales of the Green River Formation; and those occupied by extremely coarse-textured soils.

Surface water resources include 426 miles of perennial stream/reservoir, 1,279 miles of intermittent stream/ponds, 6 miles of aqueduct, and 34 springs. Annual precipitation for the study area ranges from approximately 14 to 30 inches depending on elevation. Accelerated erosion, particularly gullying, is of particular concern on the Ashley NF portion of the study area as a result of high runoff and streamflow events (rapid melting of snowpack and/or thunderstorms). Approximately 9.7 miles of streams on the Ashley NF have deteriorated or vulnerable streambank or gully conditions. Water quality of streams in the study area is generally good, with the exceptions of concentrations for arsenic, boron, fluoride, and phosphorus in several streams which exceed state water quality standards. Primary uses of the surface water resources within the study area include recreation, wildlife and fish habitat, livestock watering, and water supply.

Principal sources of groundwater within the study area are in the Uinta and Green River formations. Yields of wells from the Uinta Formation are generally in the range of 1-10 gpm. Water yielded to wells in both formations appear to be largely derived from fractures. Depth to groundwater ranges from shallow near stream beds to several hundred feet beneath interstream uplands. Movement of groundwater should be generally northward. Groundwater quality in terms of dissolved solids content range from less than 500 mg/l in the western part of the study area to between 500 and 1,000 mg/l in the eastern part of the study area. Values for groundwater quality parameters for selected wells in or near the study area do not exceed state standards for groundwater.

The study area comprises a wide range of vegetation types which support many of the traditional uses of NFS lands such as grazing, timber harvesting, and wildlife habitat. The vegetation can be described as a mosaic of plant communities strongly influenced by the natural conditions, the forces of nature, and man's uses and management activities. The predominant plant communities found in the study area are typical of semi-arid mountainous regions and include the following communities: shrub; mountain brush; pinyon/juniper; grassland; aspen; Douglas-fir, subalpine fir, and spruce; bristlecone pine, and riparian. Livestock grazing is the predominant use of the land throughout most of the study area. The number of livestock per allotment ranges from approximately 10 to 1,200 animals.

Riparian and wetland areas are primarily found on the floodplains and valley bottoms of the perennial and intermittent streams. Wetland, riparian, and buffered stream areas comprise approximately 9,400 acres (2 percent) of the study area.

Regional air quality inclusive of the study area is generally considered very good; there are no current exceedences of state and federal ambient air quality standards. There are no known emissions sources in the study area.

The environs of the study area support a variety of wildlife species. Areas of suitable sage grouse habitat comprise approximately 25,000 acres (6 percent) of the study area (Ashley NF portion). Elk critical winter range within the study area totals approximately 175,000 acres (44 percent) of the study area (primarily Ashley NF portion, including the Sowers Canyon area). Mule deer critical winter range totals approximately 22,000 acres (5 percent) of the study area. Approximately 4,200 acres of critical yearlong range for moose have been identified along drainages south of Willow Creek Ridge on the Uinta NF.

Critical summer and yearlong range for elk total approximately 6,500 acres (2 percent of the study area) and 12,400 acres (3 percent of the study area), respectively. Critical summer habitat for mule deer totals approximately 35,500 acres (9 percent of the study area) located on the Ashley NF.

Elk calving occurs on ridge tops and slopes of the Uinta NF surrounding Strawberry Reservoir in an area of approximately 18,000 acres (4 percent of the study area). Mule deer typically fawn within their summer range.

Raptors likely to be present in the study area include: Cooper's hawk, red-tailed hawk, kestrel, marsh hawk, great horned owl, goshawk, and the federal endangered species, bald eagle and peregrine falcon. Additional endangered species that potentially occur within the study area or area of influence include four fish: Colorado River squawfish, humpback chub, bonytail chub, and razorback sucker; and one plant species, *Phacelia argillacea*. Only one threatened species, a plant (*Spiranthes diluvialis*), is known to occur within the study area.

Candidate species that may potentially occupy the study area include six birds, one amphibian, two fish, and one plant.

Two potential candidate areas for designation and management as Resource Natural Areas (RNAs), Timber Cow Ridge Candidate RNA (1,280 acres) and Lance Canyon Candidate RNA (310 acres) are both located on the Ashley NF portion of the study area.

Nine roadless areas totaling approximately 144,000 acres (36 percent of the study area) have been established within the Uinta NF portion of the study area; three roadless areas are found within the Ashley NF portion of the study area. None have been recommended for wilderness designation in the RARE II evaluation or in the Utah Wilderness Act.

Recreational opportunities in the study area range from dispersed uses such as hiking and hunting to developed recreation including campgrounds and interpretive sites. The Uinta NF contains two general areas of developed recreation, the Strawberry Reservoir complex and the Diamond Fork Road (two developed campgrounds). The Strawberry Reservoir complex includes four developed campgrounds, picnic areas, visitor center, boat ramp, marina, convenience store, cafe, amphitheater, recreational vehicle rental, and RV storage areas. The Avintaquin campground above Indian Canyon on Reservation Ridge is the only developed recreation site on the Ashley NF. Recreational Opportunity Spectrum classes mapped within the study area and acreage of each are listed below:

- Semi-Primitive Non-Motorized - approximately 98,000 acres and 25,000 acres within the Uinta NF and Ashley NF portions of the study area, respectively
- Semi-Primitive Motorized - approximately 67,000 acres and 41,000 acres within the Uinta NF and Ashley NF portions of the study area, respectively
- Roaded Natural and/or Rural - approximately 49,500 acres and 100,000 acres within the Uinta NF and Ashley NF portions of the study area, respectively

High use trails on the Uinta NF portion of the study area include the Center Ridge, Bird, Fifth Water, Right Fork Maple Canyon, and Dry Canyon trails. No moderate to high use trails are present on Ashley NF lands within the study area.

Mapped Visual Quality Objectives (VQOs) define standards or goals for the visual management of the landscape and have been assigned within the study area based on scenic beauty, number and sensitivity of potential viewers, and distance from common viewpoints. VQOs mapped within the study area and acreage of each are listed below:

- Retention VQO (activities should not be evident) - approximately 8,300 acres and 4,000 acres within the Uinta NF and Ashley NF portions of the study area, respectively
- Partial Retention VQO (activities may be evident, but should remain subordinate to surrounding landscape) - approximately 121,000 acres and 19,000 acres within the Uinta NF and Ashley NF portions of the study area, respectively

- Modification VQO (activities may visually dominate the surrounding landscape) - approximately 146,000 acres and 181,000 acres within the Uinta NF and Ashley NF portions of the study area, respectively

Cultural resources of archaeological, historic, and traditional cultural properties are present within the study area. Surveys of 8,400 acres within the Uinta NF portion of the study area have identified 84 sites, a majority of which are lithic scatters. A number of historic sites have also been identified including a military encampment, trash scatters, and evidence of homesteading and animal husbandry. There are also historic dams, diversions, and ditches in the study area.

Cultural resources surveys of 5,460 acres within the Ashley NF portion of the study area have identified 57 sites, including lithic scatters, rock shelters, and a trail. Other site types known to be present in the vicinity include burials, vision quests, peeled trees, rock art, and pithouses. Historic sites include cabins and a Forest Service guard station. Representatives of the Uintah-Ouray Ute Tribe did not indicate that there were any sites of significance to them in the study area.

Federal highways, U.S. Highways 40, 6, and 191 provide the main access routes to the study area. Each is an all weather (paved), well maintained, two-lane highway; U.S. Highway 191 is periodically closed during the winter following large snowstorms. Access to the Uinta NF portion of the study area is provided by various county and Forest Service roads that generally originate from either U.S. Highway 40 on the north side of the Forest near Strawberry Reservoir, or U.S. Highway 6 on the south side of the study area.

Access to the Ashley NF is provided by U.S. Highway 40, which parallels the border of the Forest, roughly 10 miles to the north of the study area boundary. From U.S. Highway 40, various county roads run south through the Uintah and Ouray Ute Indian Reservation to the Ashley NF. U.S. Highway 191 crosses the middle of the Ashley NF portion of the study area from roughly north to south; a few secondary roads access Forest lands.

Populations of Duchesne and Uintah counties, including the cities of Duchesne, Roosevelt, and Vernal have adjusted since 1960 to economic stimuli including oil and gas development and large dam construction, water development, shale oil, and power plant projects. In the late 1970s, populations peaked and generally declined or remained static in the late 1980s. The early 1990s generally show a slight increase within the two counties and major towns/cities. Employment and

income from oil and gas activity show similar trends to population. Although other forms of employment and revenues exist, none have had the influence on the area as oil and gas development.

## **ENVIRONMENTAL CONSEQUENCES**

Impacts are defined as modifications to the environment, as it presently exists, that are brought about by an outside action. Impacts can be beneficial or adverse, short or long term, and either direct or indirect.

The authorization of a lease does not, in itself, create any consequences, or effects, to the environment. However, lease issuance grants the right to conduct oil and gas activities (exploration, development, production) which may take place at a future time with identified restrictions. The regulations direct the Forest Service to consider the subsequent actions that would be authorized by a lease, and their potentially environmentally disturbing effects, as connected actions.

Successful oil and gas exploration and development generally progresses through five basic operational phases: (1) preliminary investigation (includes geophysical exploration), (2) exploratory drilling, (3) development, (4) production, and (5) abandonment. Each of these phases may result in effects to the environment. During preliminary investigations, little surface disturbance results. Surface disturbance occurs during the second phase, exploratory drilling, when access road to the proposed well site are upgraded and/or constructed, the well pad and associated features are constructed, and drilling occurs. Surface uses associated with oil and gas field development wells include access roads; well sites; flowlines; storage tank batteries; and facilities to separate oil, gas, and water; and worker camps may be needed (in remote locations). Access roads are planned, located, and constructed for long-term use as opposed to roads built for short-term use to drill wildcat wells. Production is a combination of operations that are less intensive than construction, but does require some activities that could result in effects to the environment, such as transportation to and from the wells, treating and separating fluids, disposing produced water, and transporting oil and/or gas to market. All abandonments, whether they involve a wildcat well or an entire leasehold, include (1) the plugging of the wellbore and (2) reclamation of the land surface to a productive use.

Table S-2 summarizes the potential consequences to the environment that could result from oil and gas activities and summarizes the comparison of alternatives.

## **Cumulative Impacts**

Cumulative impacts are those impacts on the environment that result from the incremental impact of reasonably foreseeable future action when added to other past and present activities, regardless of what person or agency undertakes such other action. To determine cumulative effects, the effects of a potential oil and gas leasing development are added to those resulting from past and present activities, as well as other proposed future actions within the analysis area. At present, this includes the construction and operation of the Diamond Fork System (an extensive water development project), wetland development, aquatic habitat improvement, vegetation management activities for wildlife habitat, watershed improvements, road stabilization and restoration, and possible land acquisition on the Uinta NF portion of the study area. Within the Ashley NF, past and proposed vegetation management activities, including aspen and sagebrush treatments could contribute to cumulative effects.

With the expansion of area available for lease under Alternatives 2 to 5 combined with existing leases in the study area, there would be a cumulative increase in oil and gas extraction. However, this increase in production would have no effect on other mineral resources. Exploration wells will likely have no effect on oil and gas reserves unless exploration results in field development or result in any cumulative effects on other mineral resources.

Adverse cumulative effects on watershed resources are not anticipated. Many of the other proposed activities are designed to improve watershed conditions. Vegetation management, which involves removal of existing vegetation, may result in short-term adverse impacts to watershed resources, but the activities are designed with adequate controls in order to have minimal adverse impacts during and following implementation.

While the proposed other activities would likely produce vehicular emissions and generate fugitive dust, adverse cumulative effects on air resources are highly unlikely due to the large size of the study area and the comparatively small scale of the activities.

The other proposed activities will variously have positive, neutral, or negative effects on wildlife resources, depending on the location and type of activity. The Diamond Fork System will adversely affect hundreds of acres of mule deer winter and severe winter habitat, but most of the negative impacts will be mitigated. Vegetation/forage improvement, prescribed burns, and

watershed improvement will each affect 1,500 to 4,000 acres, and should improve habitat quality for wildlife. Other activities are likely to have little or no effect on wildlife.

Under Alternatives 2, 3, 4, and 5, one exploratory well could be drilled on the Uinta NF, disturbing 6.9 acres. Depending on its location, this disturbance could affect elk critical winter range, calving range, or summer range; mule deer critical winter range, moose critical yearlong range, or raptor habitat. Because of its relatively small area compared to the amount of wildlife habitat available, and the protection provided by the various leasing stipulations, there are likely to be no cumulative effects from the RFDS and other activities.

Within Ashley NF, major activities affecting lands and habitats is vegetation management, including aspen treatment and sagebrush treatment. Previously treated areas include aspen, sagebrush, and chained pinyon-juniper. There are roughly 9,000 acres of potential sagebrush treatment areas and 2,100 acres of previously treated sagebrush on the portion of Ashley NF within the study area and outside of the Sowers Canyon area. Small portions of the potential sagebrush treatment areas (up to a few hundred acres) are in sage grouse critical habitat, mule deer critical winter range, and/or elk critical winter range. Additionally, about 200 acres of previously treated sagebrush areas are in elk critical winter range. Potential and past aspen treatment areas are not in critical wildlife habitat.

The effects of sagebrush treatment vary by species, and according to the individual site conditions and treatment size and design. Removal of sagebrush may have detrimental effects on sage grouse, but the cumulative acreages are small compared to the available habitat. Removal of sagebrush may also reduce winter forage and thermal cover for mule deer in critical wintering areas. For elk, increases in grass forage on treated areas are likely to be a positive impact. There may be temporary cumulative impacts to elk and deer if vegetation management coincides with oil and gas development. Adverse effects may be offset in a longer time span by improved habitat quality.

Under Alternatives 1 to 4, no impacts are anticipated for threatened, endangered, and sensitive species. Under Alternative 5, some loss or disturbance of habitat of sensitive or candidate species could occur if such habitat is present within the lease area. Given the small area potentially affected by oil and gas exploration and production, measurable cumulative effects are very unlikely. Unique habitats and sensitive time periods for sensitive species are likely to be adequately protected by SLT, allowing movement of facilities by up to 200 meters and delays of activities by 60 days.

There are no Resource Natural Areas (RNAs) on Uinta NF or in the Sowers Canyon area, and therefore there will be no cumulative effects from this project. There are two candidate RNAs on Ashley NF outside of the Sowers Canyon area. The only activities planned for Ashley NF which may affect lands and habitat are various vegetation management activities. No vegetation management activities have previously occurred in the RNAs, and no potential vegetation treatment areas are within these areas. Therefore, any adverse affects will be project specific, and not cumulative.

On the Uinta NF, Alternatives 1, 2, 3, 4, and 5 would cause direct impacts on 0, 4.9, 6.9, 6.9, and 6.9 acres of roadless area, respectively. There are approximately 144,150 acres of inventoried roadless areas within the Uinta NF portion of the study area. Taking into account, the potential indirect impacts to the roadless environment caused by this level of activity, the area affected by the foreseeable level of development is not a significant contribution to any cumulative impacts that may be occurring to roadless areas.

Vegetation management is the primary land management activity anticipated to occur within the Ashley NF portion of the study area. Some of this activity includes potential sagebrush treatment sites located in Timber Canyon, within the Slab Canyon Roadless Area. This activity would cause short-term impacts to the apparent naturalness of the area. Alternatives 1, 2, 3, 4, and 5 would directly disturb 5.4, 6.7, 20.4, 26.8, and 26.8 acres, respectively within the Ashley NF, outside of the Sowers Canyon area. This represents a small percentage of the 21,280 acres of roadless areas, and would not cause significant cumulative impacts to the roadless resource.

On the Uinta NF, Alternatives 1, 2, 3, 4, and 5 could cause 0, 6.9, 6.9, 6.9, and 6.9 acres of direct disturbance, and 0, 1,339, 1,339, 1,339, and 1,339 acres of indirect impacts, respectively. There would be little to no cumulative impacts to developed recreation sites. A maximum of 1.4 percent of Semi-Primitive Non-Motorized (SPNM) land may be indirectly impacted by exploratory well activity. This would not be a significant contribution to cumulative impacts that may be occurring to SPNM lands in the Uinta NF.

On the Ashley NF, vegetation management could have short-term effects on the SPNM environment, primarily by impacting the apparent naturalness of the area. Alternatives 1, 2, 3, 4, and 5 could cause 5.4, 10.7, 20.4, 26.8, and 26.8 acres of direct disturbance, and 1,019, 2,038, 3,057, 5,095, and 5,095 acres of indirect impacts, respectively, to lands in the Ashley NF, outside

the Sowers Canyon area. This level of activity, particularly Alternatives 2, 3, 4, and 5 could cause substantial cumulative impacts to the SPNM environment. This activity is exploration well development, which is a short-term activity. Proper reclamation, including the reclamation of access roads, could return impacted lands to a semi-primitive condition.

Alternatives 1, 2, 3, 4, and 5 could cause 5.2, 8.6, 11.6, 12.9, and 12.9 acres of direct disturbance, and 750, 1,251, 1,689, 1,877, and 1,877 acres of indirect impacts, respectively, to SPNM lands within the Sowers Canyon area. Direct impacts would not be significant. Indirect effects could impact 18.4 percent of available SPNM lands in Alternative 1 up to 46 percent in Alternative 5. These impacts would be from development activity, considered to be long term. This could have a substantial effect on SPNM land in the Sowers Canyon area.

On the Uinta NF, the RFDS for oil and gas activity predicts 0, 4.9, 4.9, 6.9, and 6.9 acres of direct disturbance in Retention VQO areas in Alternatives 1, 2, 3, 4, and 5, respectively. A maximum of 6.9 acres of Partial Retention would be impacted under Alternatives 2, 3, 4, and 5. This small level of disturbance would not have a significant effect on Retention or Partial Retention lands within the Uinta NF.

On the Ashley NF, vegetation management is the primary land management activity anticipated to occur in the near future. This type of activity is short-term in nature and would likely meet the VQOs for the areas affected. The RFDS predicts 5.4, 6.7, 6.7, 26.8, and 26.8 acres of direct disturbance in Retention VQO lands on the Ashley NF, outside of the Sowers Canyon area, in Alternatives 1, 2, 3, 4, and 5, respectively. Approximately 5.4, 10.7, 20.4, 26.8, and 26.8 acres of Partial Retention VQO lands could be disturbed in Alternatives 1, 2, 3, 4, and 5, respectively. This level of disturbance would not be a significant contribution to the overall low level of cumulative impacts occurring to the visual quality of forest lands.

All lease options would include avoidance of significant prehistoric and historic archaeological resources. Any proposed alternative would have minor, if any, cumulative effects on the regional cultural resource base.

The minimal amount of road construction needed for exploration activity on the Uinta National Forest (0 miles in Alternative 1; 1.7 miles in Alternatives 2, 3, 4 and 5) would not be a significant contribution to the cumulative effect occurring to the transportation system in that portion of the

EIS study area. On the Ashley NF, few land management activities other than oil and gas exploration and development are anticipated to involve a significant level of road construction.

Few cumulative impacts are associated in the area for socioeconomics. Other vegetation treatment activities would likely have little effect on employment and income.

### **Irreversible and Irretrievable Commitment of Resources**

An irreversible commitment of resources refers to the loss of production or use of a resource due to a land use decision, that once executed, cannot be changed. An irretrievable commitment of resources refers to losses of production or use of renewable resources.

Issuance of a lease would be an irreversible decision for the life of the lease or the life of the producing field. Alternatives 4 and 5 would likely result in full field development for the Sowers Canyon area, and thus can be considered an irretrievable commitment of resources. Alternatives 2 and 3 would make the Sowers Canyon area oil and gas reserves mostly available for extraction; and Alternative 1 would allow considerable extraction in the Sowers Canyon area. Once the oil and gas has been extracted, it is not replaceable. Potential oil and gas reserves outside of the Sowers Canyon area are not expected to be irretrievably committed, because the exploratory wells are not anticipated to result in full field development.

Potential adverse effects on watershed resources include accelerated erosion and mass wasting, increased stream sedimentation, decreased water quality, gully development, increased slope stability, altered stream flows and channel degradation, long-term loss of vegetation productivity, and loss of wetland/riparian resources. Potential adverse impacts can be greatly reduced by appropriate site-specific mitigation and avoidance at the APD stage, including adherence to Forest Plan standards and guidelines, and use of best management practices. Effects on watershed resources are irretrievable (loss of production during the period of impact), and may be irreversible (not-restorable) depending on the amount and success of watershed protection and rehabilitation.

The minor and localized increases in fugitive dust and vehicle exhaust that would occur under all five alternatives would not be an irreversible or irretrievable commitment of air quality resources.

There would be a loss of big game habitat during the drilling and production, that would last until the facilities are closed and the disturbed areas are reclaimed. The commitment is for the life of

production, which averages about 20 years. The loss of big game habitat is not an irreversible commitment past the life of the field. If roads are kept open after the life of the project, the effects would continue for a longer period of time.

There will be no irreversible or irretrievable commitment of endangered or threatened species or their habitat. There will also be no irreversible or irretrievable commitment of sensitive species or their habitat under Alternatives 1-4. Under Alternative 5, minor commitment (loss) of sensitive species or their habitats may occur; this may be irretrievable for the life of the project, but not irreversible.

There would be an irreversible loss of roadless resources due to exploration activities on both the Uinta NF and the Ashley NF, outside Sowers Canyon area. The potential acres disturbed by alternative is shown in Section 4.7. Exploration activity typically lasts about 80 days. The roadless character could eventually return to disturbed lands with successful reclamation, including closure and reclamation of all access roads.

Semi-Primitive Non-Motorized (SPNM) areas have the potential to be impacted in all three areas (Uinta NF, Ashley NF, outside Sowers Canyon, and the Sowers Canyon area). The amount of potential direct and indirect impacts are shown in Section 4.8.2. There would be an irreversible loss of the SPNM resource which would last until the oil and gas activity ceased and the disturbed areas successfully reclaimed. In the Sowers Canyon area, the irreversible loss would be long term, due to the nature of development activity which can last 20 years or more. There would be no irreversible or irretrievable loss of developed recreation sites.

Retention and Partial Retention VQO lands would experience an irreversible loss in visual quality wherever oil and gas activity occurred with an SLT stipulation (Alternative 5). This loss in visual quality would last until the activity ceased and the area is reclaimed. With successful reclamation there would be no irretrievable loss of visual quality.

No irreversible or irretrievable impacts to cultural resources are expected due to established laws and regulations which will avoid impacts to significant prehistoric and historic cultural resources.

Oil and gas leasing activity would cause an irreversible impact to the transportation resource for the life of the activity. Impacts from increased traffic, road surface deterioration, and increases in dust and noise would cease once the activity was completed.

## **Unavoidable Adverse Effects**

Minor effects on watershed resources, including increased erosion, are probably unavoidable under all alternatives. However, significant adverse impacts can be avoided by use of appropriate site-specific mitigations and avoidance of critical areas. Prevention of unavoidable adverse effects for watershed resources will result both from stipulations evaluated in this EIS, and from Conditions of Approval attached at the APD stage.

Minor losses of critical big game and sage grouse habitat would occur under all alternatives, from construction of well sites, roads and pipelines. These losses of habitat typically represent up to 0.3% of available habitat. Some disturbance-related indirect effects may be unavoidable, but substantial losses of habitat effectiveness can be prevented by appropriate mitigations.

There are no unavoidable adverse effects to mineral resources, threatened, endangered and sensitive species, or Research Natural Areas.

Unavoidable impacts would occur to the roadless resource whenever oil and gas activity takes place within roadless areas. These impacts would include effects to the roadless characteristics of natural appearance and opportunity for solitude. Alternatives 4 and 5 have the potential to disturb the most roadless area, and would allow oil and gas activity under an SLT stipulation, which may not provide the necessary control to limit or reduce potential impacts.

Unavoidable impacts to Semi-Primitive Non-Motorized areas would occur wherever oil and gas activity takes place within SPNM lands. The CSU stipulation that would be applied under Alternatives 2 and 3 would reduce impacts; however, the increased human presence would cause unavoidable effects to the semi-primitive character of the area.

The presence of industrial activity, including the construction of new access roads and the actual well drilling equipment and ancillary facilities/structures would cause unavoidable impacts to the scenic quality of Retention and Partial Retention VQO lands on the Uinta NF and the Ashley NF, outside the Sowers Canyon area. Unavoidable impacts would include form, line, and color contrasts created by the new roads and drilling equipment. These impacts can be greatly reduced by careful siting of the well site. This exploration activity would be a short term impact; there would be no long term unavoidable impacts.

No unavoidable adverse effects would occur to transportation, cultural, or socioeconomic resources.

### **Relationship Between Short-term Use and Long-term Productivity**

Short-term activities, including building of roads, pipelines, and well pads, may result in long-term loss of watershed resources, such as soil erosion, gully formation, stream sedimentation, and other effects. Adverse effects on soil and watershed resources would reduce productivity of other resources, including vegetation and wildlife. Most adverse affects can be prevented by adequate site-specific mitigation and avoidance of sensitive areas. The stipulations included in this EIS would provide varying levels of protection, but additional and more site-specific mitigation would be required at the APD stage. The potential for long-term adverse effects is greatest under Alternative 5.

In general, direct losses of wildlife habitat would occur until wells are abandoned or closed, and the sites reclaimed. Similarly, direct losses of wildlife habitat will occur until pipeline ROWs are restored, and until roads are closed. Short-term activities could affect long-term productivity if there are substantial indirect effects on big game, such that there are major changes in habitat use, or if sage grouse leks are destroyed or made unsuitable. These effects are most likely under Alternative 5, and to a lesser extent under Alternative 1.

Some long-term loss or disturbance of habitat of candidate and sensitive species may occur under Alternative 5 from short-term activities.

Short-term activities could cause long-term impacts to RNAs if oil and gas development occurs and severely modifies the character of these areas. This may occur under Alternative 5, but the other alternatives have stipulations preventing such degradation.

Short-term use of both the roadless and Semi-Primitive Non-Motorized (SPNM) environment for oil and gas activities could affect the long-term productivity of these resources if access roads built for oil and gas leasing activities remained after the activity had ceased. Closure and reclamation of both the well site and roads built to serve these sites would prevent long-term effects to the roadless and SPNM resource.

With successful reclamation there would not be long-term impacts to the scenic quality of lands used for oil and gas exploration activities. Required mitigations, and existing laws and regulations that would be applied to oil and gas leasing activity, would prevent long-term effects to the transportation, cultural, or socioeconomic resources.