

## **Appendix B**

### **Cumulative Impacts Scenario**

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## Cumulative Impacts Scenario

Cumulative impacts are those that would result when lease development (as outlined in Chapter 2.0) is combined with disturbances of past and present actions and other reasonably foreseeable future actions (RFFAs), regardless of what agency or private entity undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time (40 Code of Federal Register [CFR] 1508.7). The following sections outline past and present actions and RFFAs with potential to cause cumulative impacts in combination with lease development. Relevant actions were identified through consideration of geographic location, type of activity, and type of resource impacts.

### B.1 Cumulative Impact Analysis Areas

The geographic extent of cumulative impacts varies by resource. Impacts to some resources, such as cultural resources or soils, are restricted to the area within the leases. Other resources, such as wildlife and water resources, may be affected over a larger area; therefore, cumulative impacts are assessed beyond the leases. Twelve spatially distinct cumulative impact analysis areas (CIAAs) are identified in **Table B-1**. The CIAAs primarily comprise National Forest System lands (White River National Forest [WRNF] and Grand Mesa, Uncompahgre, and Gunnison National Forest [GMUGNF]) but also include BLM lands within the Colorado River Valley Field Office (CRVFO), Grand Junction FO (GJFO), and White River FOs (WRFO), as well as non-federal lands.

**Table B-1 Cumulative Impact Analysis Areas by Resource**

Resource	Cumulative Impact Analysis Area Description	Spatial Extent (acres)	Rationale for Use
<p>Geology/Minerals/Paleontology, Soils, General Vegetation, Nongame and Small Game Terrestrial Wildlife, Special Status Species Terrestrial Wildlife, Land Use, Recreation, <b>Scenic Resources</b><sup>1</sup></p>	<p>65 existing leases (identified as "Lease Area in subsequent tables)</p>	<p>80,380</p>	<p><b>For Geology/Minerals/Paleontology, Soils, Vegetation and Land Use:</b> the CIAA is the lease area because impacts to these resources are generally limited to the area of direct disturbance and are unlikely to experience cumulative effects from development beyond the lease area. The cumulative impacts analysis considers surface disturbing activities within the lease. For small game species and nongame species and special status species: the lease area is used a proxy for suitable, historic, or occupied, habitat within the lease boundary to provide a conservatively high estimate of potential for cumulative impacts.</p> <p><b>For Recreation Resources:</b> The CIAA includes the lease zones (80,380 acres) and key recreational areas within the WRNF, as highlighted by public input. The analysis focuses on the lease areas because the 2015 ROD for Future Leasing addressed the cumulative impact of lease development through NSO stipulation and closing areas to leasing in areas of key recreational use. As a result, any cumulative impacts to recreation are most likely the result of the previously issued leases, which are discussed under direct/indirect impacts.</p> <p><b>For Scenic Resources:</b> the CIAA, while generally limited to the lease areas, also considers key area of high scenic quality within the WRNF as highlighted by public input. This area was chosen because topography and natural screening would generally serve to contain the majority of potential effects on the visual resources within the leasing area with limited impacts beyond the lease boundary; potential effects on the visual resources from RFFA development outside of the leases elsewhere on the forest would also be similarly limited. Cumulative impacts would be reevaluated at the APD stage basis when site specific knowledge is known. Mitigation would be developed as needed.</p>

**Table B-1 Cumulative Impact Analysis Areas by Resource**

<b>Resource</b>	<b>Cumulative Impact Analysis Area Description</b>	<b>Spatial Extent (acres)</b>	<b>Rationale for Use</b>
Special Status Plants <sup>1</sup>	Lease area plus a 300-foot buffer around known populations within 65 existing leases	Varies depending on species	Buffer considers impacts to known plant species and surrounding area that may be disturbed.
Cultural Resources/Native American Traditional Values, Groundwater	Lease area plus a 2-mile buffer around 65 existing leases (identified as "Lease+2 miles" in subsequent tables)	332,040	Buffer considers impacts to the context of cultural resources and extent groundwater sources that may encountered within the leases.
Transportation, Hazardous Materials/ Human Health and Safety	Lease area plus the regional road network used to access leases	N/A	Addresses impacts to new and existing local access roads from project-related transportation.
Surface Water Quality and Quantity, Aquatics <sup>2</sup>	Hydrologic Unit Code 12 (HUC-12) watersheds crossed by leases (identified as "HUC-12" in subsequent tables)	606,006	Takes into account effects of activity on-lease and downstream.
Big Game	Big Game Management Unit (GMUs) crossed by lease.	2,121,890	Puts habitat disturbance from future development into context of entire area used by big game.
Greater Sage-grouse	Preliminary Priority Habitat and Preliminary General Habitat polygons crossed by leases	14,155	Puts habitat disturbance from future development into context of entire sage-grouse habitat areas in vicinity.
Lynx	Lynx Analysis Units polygons crossed by leases	510,805	Puts habitat disturbance from future development into context of entire area used by lynx.
Livestock Grazing	Grazing allotments crossed by lease.	308,666	Puts disturbance from future development into context of entire allotment.

**Table B-1 Cumulative Impact Analysis Areas by Resource**

Resource	Cumulative Impact Analysis Area Description	Spatial Extent (acres)	Rationale for Use
Special Designations	Special Designations within leases (1 RNA and portions of roadless areas)	64,864	<b>The CIAA is limited to the lease area because the 2015 ROD for Future Leasing addressed the cumulative impact of lease development in CRAs outside of the existing leases through NSO stipulations in CRAs and RNAs, as well as through closing areas to leasing in some roadless areas. As a result, any cumulative impacts to CRAs are most likely the result of the previously issued leases, which are discussed under direct/indirect impacts. Although off-lease future development may occur as a result of lease stipulations, the development most likely would occur on private lands, outside of CRAs, a discussion of indirect impacts to CRAs from off lease development would be speculative without site-specific knowledge of development location</b>
Socioeconomics and Environmental Justice <sup>3</sup>	Mesa, Garfield, Pitkin, and Rio Blanco counties	N/A	Economics and populations of four-county area could be affected by future development.
Air Quality; Climate <sup>4</sup>	Northwest region of Colorado	N/A	Incorporates the analysis contained in the Colorado Air Resource Management Modeling Study (CARMMS).

<sup>1</sup> **The Recreation CIAA includes considers key recreational areas within the WRNF. The analysis therefore also considers RFFAs within the WRNF, as identified by the Big Game CIAA.**

<sup>2</sup> Acreage for Special Status Plant CIAA is not included in subsequent tables because the scale at which projects are identified is too coarse to differentiate between this CIAA and the lease CIAA.

<sup>3</sup> **The aquatics CIAA also extends downstream into Designated Critical Habitat for Colorado pikeminnow, razorback sucker, bonytail and humpback chub in the Colorado River.**

<sup>4</sup> Acreage for Social and Economic Values/Environmental Justice CIAA, which comprises Garfield, Mesa, Pitkin, and Rio Blanco counties, are not included in this or subsequent tables because surface disturbance is not an impact indicator used for cumulative analysis of this resource.

<sup>5</sup> Acreages for an Air Resources CIAA are not included because the cumulative impact analysis for air resources considers the entire northwest region of Colorado and relates to the analysis contained in the CARMMS.

Source: GIS from WRNF.

## **B.2 Past and Present Actions**

The primary past and present actions with surface disturbance affecting the resources analyzed in this EIS include mineral development; road development and other land development such as rights-of-way (ROWs) for pipelines, telephone lines or other developments. These types of actions are described in greater detail in Section B.2.1. Other past and present actions, such as farming, timber harvests, livestock grazing, and vegetation treatments also may affect resources considered in this EIS but do not have quantifiable surface disturbance. These are discussed qualitatively in Section B.2.2 as well as in applicable Affected Environment sections.

### **B.2.1 Actions with Surface Disturbance, Water Use or Transportation Impacts**

**Table B-2** presents total quantifiable surface disturbance by CIAA. Sections B2.1.1 through B2.1.3 provide additional information regarding the location and type of disturbance.

#### **B.2.1.1 Mineral Development**

As discussed in Section 3.3, Geology and Minerals, there are numerous gas fields in and near the existing leases as well as other mineral commodities, including coal, oil shale, uranium, and aggregate. Most mines are located within the Interstate 70 corridor (north of the Zone 1, 2, and 3 leases and outside of most CIAAs; see Figure 3.3-8). There are no existing mines near the Zone 4 lease. The Colorado Oil and Gas Conservation Commission (COGCC) database was used to identify existing oil and gas development within the CIAAs. Long term surface disturbance from oil and gas has been calculated using the well pad disturbance assumptions contained in Chapter 2.0, and is presented by CIAA in **Table B-2**. Recently approved and pending APDs within the CIAAs are discussed in Section B.3.1.2.

As discussed in Section 3.8, there are over 560,000 acre-feet and 5,400 cubic feet per second (cfs) that are assigned the use of "Industrial" within Garfield, Mesa and Pitkin counties, which would include oil and gas development. The COGCC database includes 22,540 existing wells within these three counties. Using the water use assumptions outlined in Chapter 2, past well development would have required the use 17,356 acre-feet of freshwater for drilling and 145,158 acre-feet of recycled water for well completion.

#### **B.2.1.2 Transportation and Utility Corridors**

The region is transected by or adjacent to two federal highways; three state highways; and numerous BLM, Forest Service, and county roads (see Section 3.10, Transportation). Road mileage was identified through Colorado Department of Transportation (CDOT) road layers for each of the CIAAs. Surface disturbance was calculated using typical lane and shoulder widths for each federal functional road classification (see USDOT 2013) and is presented in **Table B-2**.

#### **B.2.1.3 Other Land Development**

There are 162 communications sites on the WRNF (USFS 2014a) and the CRVFO administers over 20 communication sites each year (BLM 2015b). There are 5 communication/repeater sites within the Big Game CIAA; 3 sites within the Lynx CIAA, 2 sites within the HUC-12 and range CIAAs, portions of one site within the Lease Area CIAA, and no sites within the Special Designations or Sage-grouse CIAAs (BLM 2014a). Acreages of all identified communication sites are presented in **Table B-2**. There also are numerous existing power lines within each of the CIAAs; however, locations and disturbance acreages have not been quantified for the purposes of this analysis due to the scattered nature of the transmission lines and size of the CIAAs.

**Table B-2 Past and Present Surface Disturbing Actions by CIAA**

Past/Present Actions	Long-term Disturbance by CIAA (acres/ percent)							
	Lease Area	Lease+2 miles	HUC-12	Big Game	Sage-grouse	Lynx	Range	Special Desig.
Mineral Development <sup>1</sup>	38 / <1	590 / <1	2,658 /<1	4,262 /<1	22 /<1	693 /<1	92 /<1	3 /<1
Transportation Corridors <sup>2</sup>	91 / <1	249 / <1	1,460 /<1	3,282 /<1	28 /<1	669 /<1	390 /<1	1 /<1
Other Land Development	325 / <1	304 / <1	1108 /<1	1153 /<1	0 /<1	695 /<1	627 /<1	0 /<1
<b>TOTAL</b>	<b>454 / &lt;1</b>	<b>612 / &lt;1</b>	<b>5,226 /&lt;1</b>	<b>8,697 /&lt;1</b>	<b>50 /&lt;1</b>	<b>2,057 /&lt;1</b>	<b>1,109 /&lt;1</b>	<b>4 /&lt;1</b>

<sup>1</sup> Number of wells by CIAA: Lease Area-75; Lease+2 miles -1,180, HUC-12-5,315; Big Game-8,523; Sage-Grouse-43; Lynx-1,385; Range-183; Special Designations-5. Well count includes all Colorado Oil and Gas Conservation Commission (COGCC) well categories except “permitted locations”. Long term surface disturbance assumptions: Wellpad size- 0.5 acres per well (see Chapter 2).

<sup>2</sup> Disturbance acreages for roads assume the following widths: Interstate: 72 feet (4 lanes); principal arterial: 60 feet (4 lanes); minor arterial: 60 feet (2 lanes); major collector: 30 feet (2 lanes); minor collector: 15 feet (2 lanes); local road: 22 feet (1 lane).

Source: BLM 2015a, 2014a, COGCC 2015, CDOT 2015, USDOT 2013.

The BLM Legacy Rehost System (known as LR2000) was used to identify more recent BLM authorizations that would result in surface disturbance within any of the CIAAs. The LR2000 system reported 35 ROW authorizations between April 2014 and April 2015 in one or more CIAAs. These included ROWs for water facilities (225 acres), oil and gas pipelines (244 acres), as well as roads, salt disposal, telephone lines, communication sites and other authorizations. All actions are within the CIAAs for Lease Zones 1, 2, and 3; there were no recent actions identified within the CIAAs surrounding the Lease Zone 4. Acreages are summarized in **Table B-2**; however, it should be noted not all ROW disturbances result in long term surface disturbance (for example, pipeline disturbance is typically reclaimed). The LR2000 system also identified a number of ROW renewals, lease communitization agreements and land sales within the CIAAs. These are not included in **Table B-2** because there is no new surface disturbance associated with these authorizations. The **Forest Service** Schedules of Proposed Action (SOPA) and Notices of Proposed Action (NOPA) documents for the same time period did not identify any ROW development or other recently approved projects on NFS lands.

## **B.2.2 Other Forest Service District or BLM Field Office Actions**

The following sections describe other types of past and present development within the CIAAs. These actions are not included in **Table B-2** because they do not necessarily result in surface disturbance; may not have adverse impacts on all resources; and in some cases may have a countervailing effect on cumulative impacts.

### **B.2.2.1 Livestock Grazing and Agriculture**

Livestock grazing operations have been active within the WRNF for almost 100 years. The WRNF currently supports approximately 65 livestock grazing operations on 88 active allotments (USFS 2014a). The leases overlap a total of 19 allotments (308,522 acres). Grazing improvements within the CIAAs include fences, water tanks or ponds. Approximately 12 percent of the WRNF and 4 percent of the leases are within the grassland/forb vegetation community (USFS 2014a; also see Section 3.6, Vegetation). The CIAAs also may include lands that have been converted to agricultural uses; however, WRNF vegetation data does not specifically identify an agricultural land cover type within the WRNF.

### **B.2.2.2 Vegetation Treatments and Timber Sales**

The BLM and **Forest Service** manage vegetation resources for resistant and resilient ecological conditions including healthy, productive, and diverse populations of native or desirable nonnative plant species appropriate to the site characteristics. Vegetation treatments is emphasized in areas that have the best potential to maintain desired conditions or respond and return to the desired range of conditions and mosaic upon the landscape, using all available current or future tools and techniques. Identified treatments and timber sales are as follows:

Within the WRNF, spruce beetle infestation, or aspen mortality have resulted in substantial mortality in mature forests on the WRNF. Currently, all populations of bark beetles are at endemic levels and aspen decline is limited within the lease area (USFS 2014a). Vegetation treatment projects have occurred to remove deadfall and hazardous trees. The CRVFO is on the western edge of the current mountain pine beetle infestation; relatively few acres have been infected yet (BLM 2014b). The BLM and **Forest Service** have conducted a number of vegetation treatments (using mechanical treatment, prescribed fire or other techniques) to improve wildlife habitat, address sudden aspen decline, or reduce hazardous fuels. Recent projects include the East Sopris Fuels Reduction Project (3000 acres in the Big Game CIAA treated between 2008 and 2012; BLM 2008a); Four Mile Fuels Reduction Project (77 acres in the HUC-12 and Big Game CIAAs; BLM 2008b), and the Reservoir Gulch Prescribed Burn (1,100 acres in all CIAAs; BLM 2010).

There are approximately 89,000 acres infested with invasive plants and there are 42 known species of invasive plants (USFS 2007a). The WRNF treats approximately 1,000 acres each year. Priority areas

are those where recent soil disturbance has occurred. On BLM lands, treatment of invasive and noxious weeds is guided by the BLM's Final Programmatic EIS for Vegetation Treatment on Bureau of Land Management Lands in 17 Western States. The CRVFO weed program treats approximately 800 acres/year. Weed species that are currently rare within the CRVFO planning area receive the highest priority for treatment. Rare species include spotted and diffuse knapweed, Dalmation toadflax, and jointed goatgrass (BLM 2014b).

There have been approximately 3,620 acres of timber sales within the WRNF, of which approximately 1,150 acres were clearcut. The remainder was sanitation/salvage or shelterwood harvests (USFS 2014a). Within the CRVFO, the annual allowable harvest is 1.8 MMBF in the CRVFO; however, harvest levels have averaged less than 10,000 board feet per year in the last 5 years (BLM 2014b).

### **B.2.2.3 Resource Management Plan Amendments**

The CRVFO released a new Resource Management Plan (RMP) in July 2015. The approved RMP has a mixed use focus that allocates public land resources among competing human interests, land uses, and the conservation of natural and cultural resources. Key elements with implications for this analysis include:

- Comprehensive Air Resources Protection Protocol (CARPP) to implement an adaptive management strategy for protecting air resources, monitoring air quality, and tracking emissions for comparison against the most recent regional air quality model results.
- No surface occupancy (NSO) stipulation for municipal watersheds and public water supplies that now includes protections of any public water supply that has completed (or is in the process of completing) a Source Water Assessment through the Colorado Department of Public Health and Environment (CDPHE) source water protection program
- CSU stipulation to protect (1) the secondary zone of a source water protection area for a permitted public water system, or (2) greater than 1,000 horizontal feet but less than 2,640 horizontal feet of a classified surface water supply stream segment (as measured from the average high water mark of a waterbody) for a distance of 5 miles upstream of a public water supply intake with the classification "Water Supply" by the State of Colorado.
- NSO stipulations with protections for water quality, wetlands, riparian zones, aquatic wildlife, and shorebird habitat now written as a single NSO stipulation for perennial waterbodies and riparian zones.
- A CSU stipulation that covered riparian and wetland vegetation to a distance of 500 feet from the edge of the riparian and wetland zone was replaced with (1) an NSO stipulation CRVFO-NSO-5 which applies within 328 feet (100 meters) from the edge of riparian vegetation, and (2) a CSU stipulation CRVFO-CSU-4, which applies from 328 feet to 500 feet beyond the riparian vegetation.
- A NSO stipulation for priority wildlife habitat was revised to include state wildlife areas
- The NSO stipulation with a 100-meter buffer around all BLM sensitive plants was replaced with a revised stipulation that provides a 200-meter buffer (656 feet) for those BLM sensitive plants that occur within areas of critical environmental concern (ACECs).
- A CSU stipulation providing a 100-meter buffer (328 feet) around Harrington's penstemon habitat outside ACECs was been expanded to include all BLM sensitive plant species outside ACECs.
- Canada lynx landscape linkages were designated as ROW avoidance areas.

All stipulations from the CRVFO Final RMP have been considered in the cumulative impact analysis.

### **B.3 Reasonably Foreseeable Future Actions**

Reasonably foreseeable future actions (RFFAs) are those for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends. RFFAs within each CIAA that have potential for similar impacts to those analyzed in this chapter for each resource are summarized below.

#### **B.3.1 Actions with Surface Disturbance, Water Use or Transportation Impacts**

##### **B.3.1.1 Oil and Gas Development RFFAs**

The WRNF, GMUGNF, CRVFO, GJFO, and the WRFO, have identified lands available for oil and gas leasing that fall within some or all of the CIAAs. Each agency has developed an RFDS for future oil and gas development within its administrative boundaries. Estimated long-term surface disturbance within each CIAA is presented in **Table B-3**. Water usage associated with the each RFDS is disclosed in **Table B-4**. Associated transportation requirements are disclosed in **Table B-5**. Each RFDS and the projections and assumptions used to calculate surface disturbance by CIAA is discussed in more detail in the sections following the table.

#### White River National Forest

The administrative boundary of the WRNF overlaps with the administrative boundaries of the CRVFO (formerly the Glenwood Springs FO), Kremmling FO, Little Snake FO (very little overlap), GJFO and WRFO. The RFDS for the WRNF (USFS 2010a) was developed with consideration of the potential for oil and gas development within each of these FOs (as identified in their respective RFDs), since the FOs cover portions of the WRNF on which oil and gas activity is projected. The WRNF RFDS projects a total of 1,058 acres of long-term disturbance (from 1,014 wells from 179 wellpads within the WRNF). This disturbance acreage is inclusive of roads, pipelines, and related facilities. The RFDS for the WRNF further divides this disturbance as follows:

- 845 acres of long-term disturbance on NFS lands within the CRVFO (872 wells);
- 168 acres of long-term disturbance on NFS lands within the GJFO (132 wells);
- 45 acres of long-term disturbance on NFS lands within the Little Snake FO/WRFOs (10 wells);  
and
- No disturbance or development on NFS lands within the Kremmling FO.

As discussed in Chapter 2.0, the WRNF RFDS was used to estimate the number of wells likely to be developed within the 65 existing leases under evaluation (444 wells). Of this total, 358 wells would be on NFS lands within the Glenwood Springs FO, 76 wells would be on NFS lands within the GJFO (within leases 066926, 066733, 066732 070013, 072157, and 066917), and 10 wells would be on NFS lands within the Little Snake FO/WRFO (within lease 066926).

**Table B-3 Long-term Surface Disturbance from Oil and Gas Development by CIAA**

Management Area	Estimated Future Disturbance by CIAA (acres/percent) <sup>1, 2</sup>					
	Lease+2 Miles	HUC-12	Big Game	Range	Lynx	Sage-grouse
<b>In and around Zones 1, 2, and 3</b>						
USFS WRNF RFD-Glenwood Springs FO	496 / <1	496 / <1	496 / <1	496 / <1	496 / <1	0
USFS WRNF RFD-Grand Junction FO	94 / <1	94 / <1	94 / <1	94 / <1	94 / <1	0
USFS GMUGNF RFD	23 / <1	23 / <1	23 / <1	0	0	0
BLM CRVFO RFD-excluding RPPA	6,893 / 2	13,256 / 2.2	13,256 / <1	0	0	0
BLM RPPA	0	382 / <1	0 / 0	0	0	0
BLM GJFO RFD	71 / <1	560 / <1	1,897 / <1	0	0	71 / <1
<b>In and around Zone 4</b>						
BLM WRFO RFD	9 / <1	43 / <1	625 / <1	9 / <1	97 / <1	0
<b>TOTAL</b>	<b>7,586 / 2</b>	<b>14,854 / 2.5</b>	<b>16,391 / &lt;1</b>	<b>599 / &lt;1</b>	<b>687 / &lt;1</b>	<b>71 / &lt;1</b>

<sup>1</sup> Disturbance acreages do not include projects for which no acreage of surface disturbance has been defined.

<sup>2</sup> The Special Designations and Lease Area CIAAs are not included in this table because those CIAAs comprise only lands within the existing leases, and future oil and gas development on the existing leases is already considered in Chapter 2.0 of this EIS as part of the alternatives.

Source: BLM 2014c, 2012, 2008c; USFS 2004; WRNF 2010a.

**Table B-4 Projected Water Use from Oil and Gas Development**

RFD Well Projections in Garfield, Mesa, and Pitkin Counties <sup>2</sup>	Estimated water use (acre-feet) <sup>1</sup>	
	Drilling (fresh)	Completion (recycled)
USFS WRNF RFD-Glenwood Springs FO (514 wells, of which 21 would be horizontally drilled)	396	4,798
USFS WRNF RFD-Grand Junction FO (56 wells)	43	361
USFS GMUGNF RFD (27 wells)	21	174
BLM CRVFO RFD-excluding RPPA (14,342 wells)	11,043	92,362
BLM RPPA (5,470 wells)	4,212	35,227
BLM GJFO RFD (8,557 wells of which 3,433 would be horizontally drilled wells)	6,589	298,369
<b>TOTAL</b>	<b>22,304</b>	<b>431,291</b>

<sup>1</sup> Projected water use assumes that most or all wells would be vertical drilled except as noted. Water use is assumed to be the same as outlined in Chapter 2.0. Vertical/directional: drilling- 0.77 acre-feet per well (freshwater); completion- 6.44 acre-feet per well (recycled). Horizontal: drilling 3.22 acre-feet per well (freshwater); completion-77.3 acre-feet per well (recycled).

<sup>2</sup> BLM WRFO is excluded from water use estimates because it is located in Rio Blanco County. As discussed in Section 3.5, Water Resources, the water use analysis focuses on Garfield, Mesa, and Pitkin counties because this is where the majority of the leases are located. Within consideration of the 2,120 wells forecasted within the WRFO, total freshwater use would increase to 23,396 acre-feet and recycled water use would increase to 200,193 acre-feet.

Source: BLM 2014c, 2012, BLM 2008c; USFS 2004; WRNF 2010a.

**Table B-5 Projected Transportation Requirements from Oil and Gas Development**

RFD Well Pad Projections	Estimated truck trips		
	Drilling	Completion	Reclamation
<b>Regions 1, 2, 3</b>			
USFS WRNF RFD-Glenwood Springs FO (514 wells on 75 pads, of which 3 pads would be for 21 horizontally drilled wells)	21,900	28,635	4,050
USFS WRNF RFD-Grand Junction FO (56 wells on 25 pads)	6,650	9,425	1,350
USFS GMUGNF RFD (27 wells on 27 pads)	7,182	10,179	1,458
BLM CRVFO RFD-excluding RPPA (14,342 wells on 2,049 pads)	545,034	772,473	110,646
BLM RPPA (5,470 vertical wells on 274 pads)	72,884	103,298	14,796
BLM GJFO RFD (8,557 wells on 1,824 pads, of which 373 pads would be for 3,433 horizontally drilled wells)	727,634	732,408	98,496
<b>Region 4</b>			
BLM WRFO RFD (21,200 vertical wells on 2,556 wellpads)	679,896	963,612	138,024
<b>TOTAL</b>	<b>2,061,180</b>	<b>2,620,030</b>	<b>368,820</b>

<sup>1</sup> Transportation estimates assume that wells would be vertical or directional unless otherwise indicated. Vertical or directional wells are assumed to require 266 trips for drilling, 377 trips for completion, and 54 trips for reclamation per wellpad. Horizontal wells are assumed to require 916 trips for drilling, 497 trips for completion, and 54 trips for reclamation per wellpad.

Source: BLM 2014c, 2012, 2008c; USFS 2004; WRNF 2010a.

The remaining 570 wells projected in the RFDS, which are considered to be RFFAs, could occur in any area of the WRNF outside of the existing leases that is open to oil and gas leasing (94,123 acres as designated in the 2015 ROD for Future Leasing within the WRNF; WRNF 2015f). These areas are located in the portions of the WRNF with the highest identified oil and gas development potential, which are located adjacent to the existing leases. The remaining wells would be divided as follows:

- 496 acres of long term disturbance (514 wells, of which 21 would be horizontally drilled) on NFS lands within the Glenwood Springs FO;
- 94 acres of long term disturbance (56 wells) on NFS lands within the Grand Junction FO (assuming that all development of leases 066926, 066733, 066732 070013, 072157, and 066917 would occur within those portions of the lease within the Grand Junction FO; **and**
- No reasonably foreseeable development on NFS lands within the Kremmling FO or Little Snake/WRFOS.

Given the location of future leases and areas of high mineral potential, all 496 acres of surface disturbance on NFS lands within the Glenwood Springs FO could occur within the Big Game, HUC-12, Lease+2 Mile Buffer, Range, and Lynx CIAAs, and all 94 acres of surface disturbance on NFS lands within the Grand Junction FO could occur within the Big Game, HUC-12, Lease+2 Mile Buffer, Lynx, and Range CIAAs. This acreage is included in **Table B-3**. Water usage associated with the WRNF RFDS (which, excluding the existing leases would be 570 wells, of which 21 wells would be horizontal) is disclosed in **Table B-4**. Transportation requirements associated with the full RFDS are disclosed in **Table B-5**.

#### GMUGNF National Forest

The Big Game HUC-12 and Lease+2 Mile Buffer CIAAs include portions of the Grand Mesa National Forest (GMNF), which is a part of the GMUGNF. The RFDS for the GMUGNF (USFS 2004) anticipates development of 45 vertical wells, 27 of which would be within the GMNF. Of these 27 wells, 15 wells would be associated with a Geographic Area Proposal located near Spaulding Peak. This area is not included in any CIAAs. Locations of the remaining 12 wells are not known. There is potential for all 12 wells to fall within the Big Game, Lease+2 Mile Buffer, and HUC-12 CIAAs, since these CIAAs include much of the identified high development potential areas within the GMUGNF. The long term surface disturbance associated with 12 vertical wells would be 23 acres, including 7 miles of road (USFS 2004). This acreage is included in **Table B-3**. Water usage associated with the full GMNF RFDS (27 wells) is disclosed in **Table B-4**. Transportation requirements associated with the full RFDS are disclosed in **Table B-5**.

#### CRVFO (formerly the Glenwood Springs FO)

The RFDS developed for the CRVFO (BLM 2008c) projected a total of 5,768 wells to be developed on BLM mineral estate (not including NFS lands), with an additional 9,024 wells to be developed on private lands. Locations of wells were not determined, with the exception of 450 wells projected to occur within the Roan Plateau Planning Area (RPPA). The RPPA estimate was superseded by a new RFDS for the RPPA (BLM 2014c) that projects 5,470 federal and fee wells within the RPPA. Of this total, 1,650 wells would be located “above the rim” (i.e., above top of the cliffs), and the remaining 3,820 well would be located “below the rim” (BLM 2014c).

Development of the CRVFO RFDS for BLM and private lands would include lands within the Big Game, HUC-12 and Lease+2 Mile Buffer CIAAs. It is assumed that none of the disturbance would fall within the Range and Lynx CIAAs because these CIAAs are largely confined to NFS lands (the development of which has been considered separately).

With consideration of the 2005 CRVFO RFDS and 2014 RPPA RFDS and using the disturbance calculations included in each of these RFDSs, long term surface disturbance outside of NFS lands would be as follows:

- CRVFO excluding the RPPA: 13,256 acres of surface disturbance (from 5,318 BLM wells and 9,024 private wells on a total of 2,049 wellpads). Locations of the projected development are not disclosed but most high potential areas and existing development outside of the RPPA are in and around the existing leases (within the Big Game and HUC-12 CIAAs). The Lease+2 Mile Buffer comprises about 84 percent of the Big Game CIAA in this area. Surface disturbance within this CIAA has therefore been scaled similarly (to 6,893 acres).
- RPPA: 1,039 acres of surface disturbance (from 5,470 wells on 274 wellpads) in the entire RPPA. While most of the RPPA is outside of any of the CIAAs, the southern half of the area below the rim is within the HUC-12 CIAA. Assuming that the northern and southern halves of the area below the rim would be developed equally, there would be 382 acres of surface disturbance (from 1,910 wells on 96 wellpads) within the southern half of the area below the rim.

This acreage is included in **Table B-3**. Water usage associated with the full CRVFO RFDS (19,812 wells, including the revised RPPA estimate) is disclosed in **Table B-4**. Transportation requirements associated with the full RFDS are disclosed in **Table B-5**.

The RFDS for the CRVFO also predicts 40 geophysical surveys of 8,300 acres each, for a total temporary surface disturbance of 3,320 acres. All areas of disturbance would be fully reclaimed; therefore this acreage is not included in **Table B-3**.

#### Grand Junction FO

The Grand Junction FO contains 1,459,391 acres open to leasing. The RFDS developed for the Grand Junction FO (BLM 2012) projects 8,557 producing shale and coal bed methane wells within the FO lands in the next 20 years, of which 3,433 would be horizontally drilled. The long-term disturbance associated with this development scenario would be 6,414 acres.

Approximately 379,686 acres of the Big Game CIAA fall within the Grand Junction FO (all in GMU 421). This portion of the Big Game CIAA contains the following types of expected oil and gas exploration and development:

- Conventional oil and gas development: about 50 percent of all areas with very high development potential, 66 percent of all areas with high development potential and about 25 percent of all areas with moderate development potential;
- Mancos shale gas play: about 33 percent of all areas with high to moderate potential for development; and
- Coalbed natural gas development: 100 percent of all areas with high development potential and less than 20 percent of all areas with moderate development potential.

Based on upon the disturbance assumptions contained in the RFD, which consider both development potential and development type, there would be about 3,063 wells within the Big Game CIAA. Total long-term surface disturbance would be 2,013 acres. After excluding the surface disturbance projected to occur on NFS lands in forest-specific RFDs (94 acres on the WRNF and 23 acres on the GMUGNF, see above), there would be approximately 1,897 acres of long term surface disturbance within the Big Game CIAA.

Within the Grand Junction FO, the HUC-12 CIAA, Sage-grouse CIAA and Lease+2 Mile Buffer CIAA, while smaller than the Big Game CIAA, are located in the same area and generally contain the same

development type and potential. The portion of the HUC-12 CIAA within the Grand Junction FO is approximately 30 percent of the Big Game CIAA. The portion of the Sage-grouse CIAA within the Grand Junction FO is approximately 4 percent of the Big Game CIAA. The portion of the Lease+2 Mile Buffer CIAA within the Grand Junction FO is approximately 4 percent of the Big Game CIAA. After scaling the reasonably foreseeable development within the Big Game CIAA to these percentages, there would be about 560 acres of long term surface disturbance within the HUC-12 CIAA and 71 acres within the Sage-grouse and Lease+2 Mile Buffer CIAAs. This acreage is included in **Table B-3**. Water usage associated with the full Grand Junction FO RFDS (8,557 wells, which 3,433 wells would be horizontal) is disclosed in **Table B-4**. Transportation requirements associated with the full RFDS are disclosed in **Table B-5**.

#### WRFO

The WRFO contains the Zone 4 lease, which is located on NFS lands near the east border of the FO. The RFDS for the WRFO initially projected 14,400 wells on 2,146 wellpads; based on input from the oil and gas industry, a second RFDS was included that forecasted 21,200 wells on 2,556 wellpads (BLM 2007). There would be 31,257 acres of surface disturbance associated with this scenario. There is no information in the RFDS regarding the location of future development; however, the RFDS is largely based on the Mesaverde gas play, which is located to the west and outside of the CIAAs. With the exception of a “finger” of high/medium oil and gas potential located near the existing lease, the area within the CIAAs is classified as having low or no oil and gas potential (WRNF lands east of the existing lease are largely within the Flat Tops Wilderness Area and are not open for oil and gas development). Of the 5,800 existing boreholes mapped in the RFD, about 98 percent are located with the western two-thirds of the FO and outside of any CIAA. Assuming a similar distribution of future development, there would be about 625 acres of surface disturbance from 425 wells within the eastern third of the FO in areas open to leasing. This area is roughly analogous to the portion of the Big Game CIAA that is located in and near the Zone 4 lease (2 GMUs totaling 585,770 acres), and the analysis assumes that all 625 acres of surface disturbance could occur within the Big Game CIAA.

The Lynx, HUC-12, Range, Lease+2 mi Buffer, and Special Designation CIAAs comprise about 16, 7, 2, and 0.04 percent, respectively, of the Big Game CIAA. After scaling the reasonably foreseeable development within the Big Game CIAA to these percentages, there would be about 97 acres of long-term surface disturbance within the Lynx CIAA, 43 acres of long term surface disturbance within the HUC-12 CIAA, and 9 acres of surface disturbance within the Range and Lease+2 mi Buffer CIAAs. This acreage is included in **Table B-3**. Water usage is not disclosed in **Table B-4**, because this FO is located in Rio Blanco County, which is not considered in the water use analysis. Transportation requirements associated with the full WRNF RFDS are disclosed in **Table B-5**.

#### **B.3.1.2 Recently Approved and Pending APDs**

It is important to note that the RFDS forecasts development over the next 10 to 20 years; however, not all development would occur immediately or at the same time. The COGCC database was used to identify recently approved and pending APDs in order to understand what portion of the projected disturbance identified in **Table B-3** might be developed within the next few years. Using the disturbance calculations for wellpads and associated roads and pipelines contained in Chapter 2.0, disturbance acreages are presented in **Table B-6**.

The water use disclosed in **Table B-4** and the transportation requirements disclosed in **Table B-5** also would occur over time. As of May 2015, there were 1,529 recently approved and pending APDs within Garfield, Mesa and Pitkin counties. Development of these wells would require 1,177 acre-feet of freshwater for drilling and 9,847 acre-feet of recycled water for completion. Assuming all wells are vertically or directionally drilled and that there would be an average of 7 wells per wellpads, development of these APDs would require 26,752 truck trips for drilling, 37,915 trips for completion and 5,431 trips for reclamation.

**Table B-6 Long-term Surface Disturbance from Recently Approved or Pending APDs by CIAA**

Management Area	Estimated Future Disturbance by CIAA (acres/percent) <sup>1, 2</sup>					
	Lease+2 Miles	HUC-12	Big Game	Range	Lynx	Sage-grouse
In and around Zones 1, 2, and 3	242 / <1	704 / <1	2,300 / <1	14 / <1	105 / <1	7 / <1
In and around Zone 4	0	0 / 0	10 / <1	0 / 0	0 / 0	0 / 0
<b>TOTAL</b>	<b>242 / &lt;1</b>	<b>704 / &lt;1</b>	<b>2,310 / &lt;1</b>	<b>14 / &lt;1</b>	<b>105 / &lt;1</b>	<b>7 / &lt;1</b>

<sup>1</sup> The Special Designations and Lease Area CIAAs are not included in this table because those CIAAs comprise only lands within the existing leases, the development of which is already considered in this EIS in the alternatives.

<sup>2</sup> As of May 2015, recently approved and pending APDs by CIAA were as follows: Lease+2 miles-1 recently approved APD and 68 pending APDs; Big Game CIAA- 591 recently approved APDs and 69 pending APDs; HUC-12 CIAA- 197 recently approved APDs and 4 recently approved APDs; Range- 2 recently approved APDs and 2 pending APDs; Lynx- 26 recently approved APDs and 4 pending APDs; and Sage-grouse- 2 recently approved APDs. Long term surface disturbance assumptions: Wellpad - 0.5 acre per well, road -3 acres per well (see Chapter 2.0).

Source: COGCC 2015.

**B.3.1.3 Other Development RFFAs**

The BLM ePlanning NEPA Register was used to obtain information regarding RFFAs on BLM lands. **Forest Service** SOPA and NOPA documents were used to obtain information regarding RFFAs on National Forest System lands. **Table B-7** provides a summary anticipated surface disturbance by CIAA; the following sections describe each project in more detail. All of the identified RFFAs are in Zones 1, 2, and 3. Oil and gas development projects were not included, as they are assumed to be included in the RFDs described in Section B.3.1.1. Vegetation treatments, which do not necessary have surface disturbance or adverse impacts to resources, are discussed separately in **Section B.3.2.1**.

**Table B-7 Long-term Surface Disturbance from Non-Oil and Gas Development by CIAA**

Management Area	Section B.3.2.1. Disturbance Acreages by CIAA (acres / percent) <sup>1,2</sup>	
	Lease, Lease+ 2 mi, HUC-12. Lynx, Sage-grouse, Range, Special Desig.	Big Game
Hunter Reservoir Enlargement	0	61 / <1
Young's Ditch trail reroute	0	<0.5 / <1
CDOT Highway 133 Debris Dump Site and Placita Roadside Landscaping	0	9 / <1
Rio Grande Connection Trail Reroute	0	<0.5 / <1
Trickel Park Road Improvement Project	0	9 / <1
<b>TOTAL</b>	<b>0</b>	<b>99 / &lt;1</b>

<sup>1</sup> Disturbance acreages do not include projects for which surface disturbance is located with previously disturbed areas or projects for which no acreage of surface disturbance has been defined.

<sup>2</sup> While these projects so occur within the CIAA for Socioeconomics, this CIAA is not included in this table because surface disturbance is not an impact indicator used for impact analysis of this resources. See Section 4.17 for the impact indicators related to the cumulative impacts analysis for Socioeconomics.

Source: BLM 2015d; USFS 2015a,b; 2014b; 2007b.

National Forest System Lands

The WRNF SOPAs and NOPAs for 2015 (USFS 2015a) identified the following projects with potential for surface disturbance within one or more of the CIAAs:

- Holy Cross Energy Underground Powerline: new underground powerline to the top of Sunlight ski area. Disturbance is anticipated to be limited to 1-foot-wide trenches within existing ski runs. The ski area is within the HUC-12, Big Game, Range and Lynx CIAAs, but is not included in surface disturbance calculations in **Table B-6** because the powerlines would be installed within existing disturbance areas.
- CDOT Highway 133 Debris Dump Site and Placita Roadside Landscaping: CDOT is proposing to permanently store natural road debris inside a 9.17-acre man-made loop in the highway east of McClure Pass on SH-133. Project also will fill in a 16.1-acre depression from original road construction and revegetate the old Placida fill site (USFS 2014b). The project is within the Big Game CIAA. New surface disturbance acreage is included in **Table B-6**.

The GMUGNF SOPAs and NOPAs for 2015 identified the following projects with potential for surface disturbance within one or more of the CIAAs:

- Hunter Reservoir Enlargement: Proposal to enlarge existing reservoir from 19 to 80 acres and improve/relocate the access road. 32 acres of wetlands would be inundated; and grass/forb/shrub and spruce/fire vegetation types also would be affected (USFS 2007b). The project is in the Big Game CIAA and is included in **Table B-6**.
- Young's Ditch trail reroute: closing 1.25 miles of trail along the banks of an existing ditch and creating a 0.9-mile section of trail as a new NFS trail route to Young's Lake (USFS 2015b). The project is within the Big Game CIAA. Assuming a 3-foot trail width, total new surface disturbance would be less than 0.5 acre and is included in **Table B-6**.
- Trickle Park Road Improvement Project: Re-conditioning of the surface of Trickle Park Road #121 from Alexander Lake Lodge to the North Forest Boundary, including 1 mile of new pavement from the intersection with FDR #123 to East Crag Crest Trailhead (USFS 2015b). Portion of this project may be within the Big Game CIAA. Assuming a road width of 24 feet, there would be approximately 9 acres of new surface disturbance, which is included in **Table B-6**.

#### BLM Lands

The BLM ePlanning NEPA Register for fiscal year 2015 and the CRVFO FO webpage identified 49 projects within the CRVFO and 93 projects initiated in previous years that are still reasonably foreseeable. Of these projects, three RFFAs were identified as having potential for surface disturbance in one or more CIAAs that is not related to oil and gas development.

- Jolley Mesa Natural Gas Pipeline: natural gas pipeline located almost entirely on private lands, with 18 acres of proposed disturbance, all located within previously disturbed areas (BLM 2015c). The area is within the Big Game CIAA, but is not included in surface disturbance calculations in **Table B-6** because the pipeline would be installed within existing disturbance areas.
- Rio Grande Connection Trail Reroute: reroute of a trail with steep, eroding and unsustainable reaches and trespasses on private property; 1.3 miles of new trail would be constructed and maintained and 0.75 mile of existing trail would be closed to mechanized and motorized use (BLM 2015d). The proposed route would be up to 3 feet wide. The project is within the Big Game CIAA. Total new surface disturbance would be less than 0.5 acre and is included in **Table B-6**.
- Porter Ditch enlargement (BLM 2015e): The project is within the Big Game, HUC-12, and Lynx CIAAs; however, the BLM has not yet identified any acreage disturbance for the project. Accordingly, this project is not included in **Table B-6**.

The ePlanning NEPA Register for fiscal year 2015 identified 14 RFFAs within the Grand Junction FO. None of the RFFAs are in any of the CIAAs.

The ePlanning NEPA Register for fiscal year 2015 identified 43 RFFAs within the Grand Junction FO. Of these projects, only the Wilson Creek Trail Project has potential for surface disturbance within a CIAA. The project proposes to close trails that are causing resource damage and construct sustainable trails open to motorized vehicles up to 50 inches wide. The project is within the Big Game CIAA; however, the BLM has not yet identified any acreage disturbance for the project. Accordingly, this project is not included in **Table B-6**.

#### **B.3.2 Other Forest Service District or BLM Field Office Actions**

The following sections describe other types of RFFAs within the CIAAs. These actions are not included in **Table B-6** because they do not necessarily result in surface disturbance; may not have adverse impacts on all resources; and in some cases may have a countervailing effect on cumulative impacts.

### B.3.2.1 Vegetation Treatments and Hazardous Fuels Reduction RFFAs

**Table B-8** provides a summary by CIAA of vegetation treatments and hazardous fuels reduction RFFAs for which acreage information is available. All of the identified RFFAs are in Zones 1, 2, and 3. Each project is discussed in more detail in the following sections following the table.

#### NFS Lands

There are three vegetation treatments and hazardous fuels reduction projects that would occur within NFS lands in one or more CIAAs:

- South Rifle Habitat Enhancement Project (USFS 2014c): wildlife habitat improvements on approximately 6,000 acres across the south side of the Rifle Ranger District. Treatments include cutting sagebrush, oakbrush, and mountain shrub and prescribed fire in aspen, pinyon-juniper, and Douglas fir as follows:
  - Battlefield Prescribe burn units: (up to 3,000 acres): In Big Game, HUC-12, Range, Special Designations, Lynx, and Lease Area CIAAs.
  - Oakbrush/mountain shrub mechanical treatments (2,000 acres): In Big Game, HUC-12, Range, Lynx, and Lease Area CIAAs.
  - Sagebrush Enhancement Projects (up to 600 acres): In Big Game, HUC-12, Range, Special Designations, Lynx, and Lease Area CIAAs.
  - Bighorn Sheep Travel Lane Mechanical Treatments (up to 400 acres): locations not identified but assumed to occur in Big Game, HUC-12, Range, Special Designations, Lynx, and Lease Area CIAAs.
- Aspen/Sopris Wildlife Habitat Improvement Project (WRNF): prescribed fire and mechanical treatments between 2015 and 2018 in identified blocks of forest, shrubland, and grassland vegetation types to improve wildlife browse and foraging habitat (USFS 2010b). Portions of the Glenwood Treatment Area are within the Big Game and HUC-12 CIAAs. Portions of the Crystal River Treatment Area are within the Big Game and Lynx CIAAs. With consideration of both treatment areas, there would be approximately 11,500 acres of treatment within the Big Game CIAA (all within GMU 43), 2,100 acres of treatments areas within the HUC-12 CIAA (in Outlet Roaring Fork River and the Edgerton Creek-Crystal River subwatersheds), and 6,370 acres within the Lynx analysis area (in the Crystal West LAU). These acreages are included in **Table B-7**.
- Spruce Beetle Epidemic and Aspen Decline Management Response Project (GMUGNF NF): The GMUGNF proposes between 4,000 to 6,000 acres of commercial harvest treatments over a 10-year period to treat affected stands, improve the resiliency of stands at risk of these large-scale epidemics and reduce the safety threats of falling, dead trees and large-scale wildfires. Locations have not yet been defined; focus areas for hazard mitigation include open roads; in and around campgrounds, developed and dispersed recreation sites, or other administrative facilities; within ski areas boundaries, power transmission lines ROW and border zones, and communication, water, pipeline, and other utility corridors; near other inventoried infrastructure that could be at risk from falling trees; and within wildland-urban interface. There also is focus on area where commercial mechanical harvest may occur (USFS 2014d).

**Table B-8 Vegetation Treatments and Hazardous Fuels Reduction RFFAs by CIAA**

Treatment Project	Disturbance Acreages by CIAA (acres/percent) <sup>1, 2</sup>							
	Lease	Lease +2 mi.	HUC-12	Big Game	Lynx	Sage-grouse	Range	Special Desig.
South Rifle Habitat Enhancement Project	6,000 / 7	6,000 / 2	6,000 / 1	6,000 / <1	6,000 / 1	0 / 0	6,000 / 2	3,000 / 9
Aspen/Sopris Wildlife Habitat Improvement Project	0	0	2,100 / <1	11,500 / 1	6,370 / 1	0 / 0	0 / 0	0 / 0
Lookout Mountain Communications Site Hazardous Fuels Reduction Project	0	0	25 / <1	25 / <1	0 / 0	0 / 0	0 / 0	0 / 0
Spruce Creek Oakbrush Thinning Project	0	0	100 / <1	100 / <1	100 / <1	0 / 0	0 / 0	0 / 0
Uncle Bob Oakbrush Thinning Project	0	0	200 / <1	200 / <1	200 / <1	0 / 0	0 / 0	0 / 0
Uncle Bob Mountain Road Hazardous Fuels Treatment Project	0	0	2,100 / <1	2,100 / <1	2,100 / <1	0 / 0	0 / 0	0 / 0
Cedar Springs II Vegetation Treatment Project	0	0	800 / <1	800 / <1	0 /	0 / 0	0 / 0	0 / 0
Cedar Mountain Fuels Reduction Project	0	0	667 / <1	667 / <1	0 /	0 / 0	0 / 0	0 / 0
<b>TOTAL</b>	<b>6,000 / 7</b>	<b>6,000 / 2</b>	<b>11,992 / 2%</b>	<b>21,392 / 1</b>	<b>14,770 / 3</b>	<b>0 / 0</b>	<b>6,000 / 2</b>	<b>3,000 / 9</b>

<sup>1</sup> Disturbance acreages do not include projects for which no acreage of surface disturbance has been defined.

<sup>2</sup> For each project, the total projected treatment acreages have been included within each CIAA because there is significant overlap between the CIAAs and because treatments areas and treatment locations have not been finalized and therefore have potential to occur within any of the CIAAs.

Source: BLM 2015f,g,h; Larson 2015a,b; Ringer 2015; USFS 2014c,d; WRNF 2010b.

Based on maps showing recent spruce beetle activity and areas of timber suitability (USFS 2013), there is potential for some treatments to occur in the Big Game, Lynx, Special Designations, and potentially the HUC-12 CIAAs; however, these areas are largely within roadless areas and do not contain many of the focus areas identified by the **Forest Service**. Accordingly, treatment acreage is not included in **Table B-7**.

#### BLM Lands

The CRVFO proposes to conduct the following six vegetation treatment and hazardous fuels reduction projects:

- Lookout Mountain Communications Site Hazardous Fuels Reduction Project: fuel reduction project to maintain the effectiveness of an 11-acre treatment area and remove vegetation in a mosaic pattern on an additional 14 acres (BLM 2015f). The project is located east of Glenwood Springs, within the Outlet Roaring Fork River subwatershed. This project would be within the Big Game and HUC-12 CIAAs.
- Spruce Creek Oakbrush Thinning Project: thinning between 30 percent and 50 percent of dense oakbrush stands totaling approximately 100 acres in the Spruce Creek area. The project was identified by Colorado Parks and Wildlife (CPW) and BLM as mitigation for year-round drilling on BLM lands (BLM 2015g). The project would be within the HUC-12, Big Game, and Lynx CIAAs.
- Uncle Bob Oakbrush Thinning Project: thinning between 30 percent and 50 percent of dense oakbrush stands totaling approximately 200 acres to forage quantity and quality for big game ungulates (deer and elk). The project was identified by CPW as mitigation for the Bull Mountain pipeline, which was constructed on BLM and White River National Forest lands (BLM 2015h). The project would be within the HUC-12, Big Game and Lynx CIAAs.
- Uncle Bob Mountain Road Hazardous Fuels Treatment Project: 2,110 areas targeted for mechanical treatment and/or prescribed fire (Larson 2015a). The project would be within the HUC-12, Big Game and Lynx CIAAs.
- Cedar Springs II Vegetation Treatment Project: 800 acres of pinyon-juniper vegetation removal (Ringer 2015). The project would be located within the Big Game and HUC-12 CIAAs.
- Cedar Mountain Fuels Reduction Project: removal of pinyon-juniper vegetation in mule deer winter range via hydro-axing (283 acres) and hand-thinning (384 acres; Larson 2015c). The project would be located within the Big Game and HUC-12 CIAAs.

Treatment acreage is included in **Table B-7**. The ePlanning NEPA Register for fiscal year 2015 did not include any proposed vegetation treatments in any of the CIAAs within the Grand Junction of WRFOs.

#### **B.3.2.2 Battlement Reservoir Reconstruction**

The Battlement Reservoirs are a chain of seven reservoirs, south of Parachute, Colorado. Four of the seven dams have breached to some extent, and all the dams are in unsatisfactory condition. The **Forest Service** proposes to reconstruct a few of the reservoirs in the near future. Two to three reservoirs will be maintained shallow for wildlife habitat (USFS undated). The Battlement Reservoirs fall within the HUC-12 CIAA and the Big Game CIAAs.

#### **B.3.2.3 Livestock Grazing**

The continuation of livestock grazing at current levels on a long-term basis on WRNF and BLM grazing allotments is reasonably foreseeable. BLM NEPA register and **Forest Service** SOPAs have identified a number of grazing allotment reauthorization projects, some of which are within the Big Game and HUC-12 CIAAs.

### **B.3.3 County Actions**

The project area includes portions of Garfield, Mesa, Pitkin, and Rio Blanco counties. Garfield County contains portions of lease Zones 2 and 3. The east planning area of Mesa County includes all of the Zone 1 leases as well as leases within Zones 2 and 3. The majority of the Zone 3 leases are in Pitkin County. The Zone 4 lease is located in eastern Rio Blanco County.

County actions considered in the cumulative impacts assessment of lease development include future land use planning applicable to oil and gas development, future traffic projections; transportation improvement plans affecting the proposed transportation corridors, and land or infrastructure development projects in the portions of the CIAAs outside the existing leases.

#### **B.3.3.1 Garfield County**

The Garfield County Comprehensive Plan (2013) recognizes energy development as a dominant industry with potential for strong job growth and considerable benefit to the economic health of the county over the next 20 years. The future land use map includes a Resource Production/Natural (RPN) land use designation, which is applied to agriculture and grazing land used primarily for oil, gas, oil shale, coal mining, gravel mining, including support buildings and facilities needed for the natural resource extraction industry, and other business uses that can be adequately buffered from adjacent incompatible uses. The Plan states that oil and gas facilities such as compressors are appropriate in all land uses so long as they meet the respective mitigation requirements of the Land Use Development Code. Comprehensive Plan strategies and actions to address the potential issues associated with mineral development include adoption of a Mineral Extraction Master Plan (Garfield County 2013).

Because the most affordable housing in the county will continue to be in the Colorado River Valley, the Garfield County Comprehensive Plan identifies continued long commutes (and attendant time and costs), traffic congestion (especially through the SH-82 corridor in Glenwood Springs), and road impacts. The Glenwood Springs Comprehensive Plan (2011) estimates 47,900 to 52,000 vehicle trips per day on Grand Avenue by 2035. The Plan states that absent any other significant traffic reductions or transportation capacity strategies, Grand Avenue would have to be widened to six lanes in order to accommodate this level of traffic (an undesirable option because of its significant negative impacts on the Downtown). Additionally, the Grand Avenue Bridge, which has been classified by the Colorado Department of Transportation as being functionally obsolete (though not structurally deficient) will need to be widened to four full lanes to optimize safety and traffic flow and to accommodate projected traffic levels (Glenwood Springs 2011).

The Glenwood Springs Comprehensive Plan also identifies the following RFFAs:

- Development of a new substation adjacent to the new wastewater treatment facility on the west side of the city; and
- Expansion of the existing landfill through the purchase of 62.5 acres of adjacent land from the BLM under the Recreation and Public Purposes Act (Glenwood Springs 2011).

Both of these projects would be in or near the HUC-12 and Big Game CIAAs.

#### **B.3.3.2 Mesa County**

The Mesa County Comprehensive Plan (2013) recognizes and seeks to protect its rural character. Within its east planning area (where the existing leases and CIAAs are located), the Plan identifies moderate to high agricultural, vegetation and wildlife values that need to be acknowledged in future land use planning and indicates that continued ranching may require the use of public lands to remain viable. There is no restriction on oil and gas development; however, the Plan identifies energy development as a key planning issue with potential to impact areas at levels not previously anticipated. Planning goals include

coordination with federal land managers to protect, conserve and efficiently manage the county's public lands. Mesa County also has developed a Mineral and Energy Resources Master Plan (2011), which offers a mapping tool designed to allow the user to identify locations of sensitive landscapes, and outlines mitigation measures to reduce impacts to mapped sensitivities.

The Grand Valley 2040 Regional Transportation Plan Update (2014), which identifies investments and strategies to address transportation needs within Mesa County for the next 20 years, indicates that the Highway 6 and I-70 corridor north of De Beque (within the Transportation CIAA), is expected to experience heavy traffic impacts driven by energy-related development. The Plan identifies two critical regional priority projects anticipated to be implemented between now and 2040 in this area: a truck bypass and a new I-70 interchange, both in De Beque (Mesa County 2014).

### **B.3.3.3 Pitkin County**

Future development is guided by the Pitkin County Comprehensive Plan (2003) and 11 Rural Area plans. Lands within the Lease Area, Big Game, Lynx, HUC-12, and Range CIAAs are generally guided by the Crystal River Valley Comprehensive Plan. The Big Game CIAA also includes portions of the Down Valley and the Snowmass-Capitol Creek Valleys Master Plans. There are no specific RFFAs discussed within any of the plans; however, as stated in the Pitkin County Comprehensive Plan, a unifying theme and overarching goal of all area sub-plans is to sustain the existing rural character of Pitkin County (Pitkin County 2003a):

- Crystal River Valley Master Plan goals include preservation of the natural environment and protection of rural character (specifically open space, wildlife habitat, water quality, and the Highway 133 viewshed); recognition of agriculture as an irreplaceable treasure; and limitation of growth consistent the physical carrying capacity, rural character, and natural and built environment of the valley (Pitkin County 2003b).
- Down Valley Comprehensive Plan goals include managing the rate of growth; preserving agricultural lands; and preserving environmental quality. The plan's Future Land Use Map designates about 40 percent of the lands in the planning area as "Agricultural/Wildlife Reserve." The plan also recommends that a scenic foreground be established for the lands that are highly visible from Highway 82 and Brush Creek Road (Pitkin County 1987).
- Snowmass-Capitol Creek Valleys Master Plan goals include enhancement and preservation of the dominant agricultural and rural residential character of the Snowmass/Capitol Creek valleys. The Plan specifically seeks to prevent mining, mineral exploration, oil and gas drilling and exploration, sand and gravel pits, rock crushers, concrete batch plants, and other extractive operations from occurring on private lands within the Caucus Area and, to the extent possible, discourages such activities on public lands (Pitkin County 2003c).

### **B.3.3.4 Rio Blanco County**

The Rio Blanco Master Plan (2011) emphasizes protecting access to public lands, promoting the preservation of open lands, keeping rural spaces intact, and minimizing adverse agricultural impacts. While recognizing that resource extraction is important to the current and future county economy, the Plan states that new economic opportunities may emerge with the inevitable decline of finite natural resources and recommends that the county: 1) explore possibilities of new or expanded existing economic opportunities to decrease negative effects of unpredictable energy market; 2) create an economic transition plan including job retraining and business diversification aimed at long-term stability; and 3) direct attention to the mainstays of agriculture, outdoor recreation, tourism and the pristine environment (Rio Blanco 2011).

Relevant transportation goals include improvements to County Road 5 and the development of alternative routes into the Piceance Basin including Fourteen Mile Creek and County Road 122. The Plan also indicates that new development would be required to improve roadways commensurate with development induced traffic impact, and that energy companies should provide transportation in and out of the Piceance Basin from established carpool pick-up/drop-off points for large energy development projects requiring a substantial work force (Rio Blanco 2011).

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