Sustainable Energy

Key Points

- Under all the alternatives and the Proposed RMP, the majority of the land in the decision area would be available for the potential development of sustainable energy resources.
- Alternative C would produce the largest amount of biomass.
- While Alternative A would have the largest acreage in exclusion areas, the BLM concluded that Alternative D would most likely constrain substantially wind energy and transmission line development by designating over a third of the decision area as avoidance areas.
- While there is currently no geothermal development and limited potential in the decision area, all action alternatives and the Proposed RMP would be less constraining to geothermal development than the No Action alternative, with Alternative A being the least constraining.

Summary of Notable Changes from the Draft RMP/EIS

The BLM corrected the quantities of slash available from timber harvest operations using a more direct conversion factor. In addition, the BLM recalculated the amount of available biomass, moving from green-ton metric to bone-dry-ton metric, which more consistently reflects energy available from biomass.

Background

For the purposes of this Proposed RMP/Final EIS, the BLM uses the term 'sustainable energy' in lieu of the term 'renewable energy', which the laws and policies that guide the management of the resources addressed in this section more commonly use. The term 'renewable' implies that an energy resource undergoes a cycle of availability (i.e., a cycle that alternates between energy depletion and energy replenishment). For this analysis, the BLM believes that it is more accurate to characterize these resources as sustainable.

Issue 1

How would management alternatives for forest treatments affect the availability of slash as a biomass energy source?

Summary of Analytical Methods

The BLM evaluated the alternatives and the Proposed RMP and quantified the projected volume of timber harvest in million board feet (MMbf). Using this harvest data, the BLM quantified the maximum quantities of slash that would be produced using the assumption that 750 bone dry tons of slash would be made available for every MMbf of harvest.

While other types of biomass exist, the BLM focused this analysis on slash (i.e., wood residue from timber harvest) since this is the specific type of biomass that provides the most practical opportunity for sustainable energy development in the planning area. Slash consists primarily of the branches and treetops of harvested merchantable timber. Slash excludes other biomass present in abundance but which is more difficult to transport such as snags, downed logs, and stumps (Cross *et al.* 2013, p. 1) or which might be left for other resource uses.

The Planning Criteria provides more detailed information on analytical assumptions, methods and techniques, and geographic and temporal scales, which is incorporated here by reference (USDI BLM 2014, pp. 164–165).

Background

While the availability of 750 tons of bone-dry slash per MMbf of timber is an acceptable assumption for the purposes of this analysis, the precise amount of biomass produced would vary based on several factors including the location and type of harvested stand. Other factors include the amount of non-merchantable hardwoods, the amount of sub-merchantable material designated for cutting and removal in fire-prone stands, and the level of defect within a given stand. Thinning would typically produce biomass that consists mainly of tops and sub-merchantable stems whereas regeneration harvest would produce more cull material and broken pieces.

Topography, vegetation, and yarding systems would affect the accessibility of biomass produced through timber harvest. Areas suitable for ground-based equipment would have a higher recovery level. Steep areas with dense brush would have a lower recovery level due to the difficulty of locating the material and bringing it to a landing using cable-yarding systems.

The sale of biomass also depends on market conditions. The amount sold is generally less than what is available because biomass typically lacks sufficient energy density for economical transport as a fuel for electrical power generation except where generating plants are close to harvest areas. A study sponsored by the U.S. Department of Energy (DOE) on the harvesting and transporting of biomass resulted in a negative energy balance (i.e., the expenditure of energy necessary to harvest was greater than was yielded by the product harvested; USDOE 1981, p. 5).

There are wood fiber biomass combustion boilers at 21 industrial or institutional sites in the planning area, supplying heat for industrial processes. At nine of these sites, steam-driven generators produce electric power. Private individuals and commercial companies also cut firewood on BLM-administered lands, which the BLM includes in the definition of biomass available on BLM-administered lands but does not come from slash.

Affected Environment

Biomass occurs in abundance throughout the planning area, but as described above, factors such as the distance from harvest areas to power generation sites influence its sales and use. Based on the harvest level in 2012, 152,782 bone-dry tons of biomass were available as slash from BLM-administered lands within the planning area. In addition to its use for energy generation, biomass currently harvested in the decision area is also sold for use in landscaping material, as raw manufacturing material for fiberboard, or for making charcoal briquettes.

Environmental Consequences

Table 3-214 shows the biomass available as slash from BLM-administered lands. As described above, a number of additional factors affect the biomass actually produced, as opposed to simply made available, from BLM-administered lands. These factors would likely lead to the production of less biomass than is described as available in **Table 3-214**. These factors would be consistent across alternatives and the Proposed RMP so the results in the table provide a reasonable basis for comparing the relative levels of biomass made available. Alternative C would make available the most biomass, followed by the No Action alternative, Alternative B, the Proposed RMP, Alternative A, and Alternative D.

Table 3-214. Biomass available from BLM-administered lands as timber harvest slash

Alternative/ Proposed RMP	Biomass Available (Bone Dry Tons)
No Action	300,000
Alt. A	187,500
Alt. B	248,250
Alt. C	416,250
Alt. D	135,000
PRMP	211,650

Issue 2

How would right-of-way avoidance and exclusion areas in the alternatives affect the potential siting of wind energy developments and sustainable energy corridor designations?

Summary of Analytical Methods

As presented in the Planning Criteria (USDI BLM 2014, pp. 164–165), the BLM intended to use the existing wind energy resource data compiled in the 2005 Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Land in the Western United States (USDI BLM 2005) to assess how the alternatives and the Proposed RMP affect the potential for wind energy development. However, the BLM found that the data in the 2005 Wind EIS is not detailed enough to reveal specific areas of high-energy potential within the planning area.

Instead, the BLM compared acres of right-of-way avoidance and exclusion areas to determine the extent to which each alternative and the Proposed RMP might constrain the development of wind energy and sustainable energy transmission. The BLM administers both wind energy and transmission lines through the granting of a right-of-way, so avoidance and exclusion areas would directly affect the potential for developing wind energy and transmission lines on BLM-administered lands. For the purposes of this analysis, the BLM assumed that right-of-way avoidance areas would preclude wind energy and transmission lines in most cases.

Background

According to the American Wind Energy Association, Oregon as a whole currently has approximately 435 megawatts of installed wind power generating capacity with another 140 megawatts proposed. The 2005 Wind EIS projected that by 2025, 196 megawatts of wind energy will originate from BLM-administered lands throughout Oregon (USDI BLM 2005, pp. 5–104).

The National Renewable Energy Laboratory (NREL) wind resource map for Oregon indicates that the state has wind resources consistent with community-scale production. The good-to-excellent resource areas for community-scale production are concentrated on ridge crests throughout Oregon. None of the good-to-excellent non-ridge crest areas with at least good wind resource potential are located in the decision area. There are a few sites with wind resources of this quality along the ridge peaks of the Cascade Range on the eastern border of the planning area and scattered along the Pacific coast. Current NREL mapping resolution does not reveal the presence of utility-scale wind resources in the decision area (USDOE 2014).

Wind energy development on BLM-administered lands is permitted through right-of-way authorizations in accordance with requirements of the FLPMA and the 2008 BLM Wind Energy Development Policy.

Affected Environment

Currently, there is no wind energy production or proposals for wind energy production on BLM-administered lands in western Oregon. As noted in the background section, there are no known sites with potential utility-scale wind development within the decision area of this RMP.

In addition to this limited potential, the lack of critical infrastructure necessary for development also limits the growth of sustainable energy resources (including wind) in western Oregon. There are currently no transmission lines that could easily transmit energy collected from wind energy in the planning area. There are no current plans to construct transmission lines that could fill this need. Any transmission line through BLM-administered lands would require a right-of-way.

Environmental Consequences

The alternatives and the Proposed RMP differ in the acreage of both exclusion areas and avoidance areas (**Table 3-82)**. Since the BLM is unable to grant rights-of-way for energy transmission corridors in exclusion areas (unless legally mandated), Alternatives A, B, and C, and the Proposed RMP would decrease the percent of the decision area compared to the No Action alternative in which the BLM could grant a right-of-way for wind power. Alternative A would exclude wind energy and transmission line development from the largest percentage of the decision area, while Alternative D would slightly decrease the current acreage of exclusion areas.

Table 3-215. Right-of-way exclusion and avoidance areas

	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
Exclusion Areas	43,590	130,597	93,274	93,274	42,568	107,790
Avoidance Acres*	243,928	179,436	326,510	575,444	871,713	456,801

* Right-of-way avoidance total acreage is not a direct sum of the individual criteria acres due to criteria that overlap geographically. Areas that overlap with right-of-way exclusion areas are subtracted from the sum of the total avoidance acres because right-of-way exclusion is more restrictive than right-of-way avoidance.

The BLM is able to grant a right-of-way in avoidance areas if a right-of-way is compatible with the protection of the values for which the BLM designated the avoidance area or if no other route is possible. However, it is unlikely that the development of wind power would be compatible with the values for which the BLM would designate the avoidance areas. The action alternatives and the Proposed RMP would designate ACECs, RMAs, Wilderness Study Areas, some WSRs, and VRM Class II areas as avoidance areas (see the Lands and Realty section of this chapter). Wind energy development would adversely affect the values associated with these designations, such as wildlife and vegetation, recreation, and visual quality; the 2005 Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Land in the Western United States analyzed the effects of wind energy development and that analysis is incorporated here by reference (USDI BLM 2005, Chapter 5, pp. 1–102). These avoidance areas would thus likely constrain the development of wind energy and sustainable energy transmission corridors on these BLM-administered lands. Alternative A would decrease the acres of avoidance areas compared to the No Action alternative while Alternatives B, C, and D, and the Proposed RMP would substantially increase this acreage (**Table 3-82**). Although Alternative A would have the largest acreage in exclusion areas, the BLM concludes that Alternative D would most likely constrain wind energy and transmission line development substantially by designating over a third

of the decision area as avoidance areas. However, because of the absence of any current wind energy production, proposals for wind energy production, or known sites with potential utility-scale wind development in the decision area, and the lack of critical infrastructure necessary for wind energy development, the differences in acreage in the decision area available for wind energy development would have no meaningful effect on any reasonably foreseeable wind energy development in the decision area.

Issue 3

How would the alternatives affect the development of geothermal as a sustainable energy source?

Summary of Analytical Methods

To assess the effects of the development of geothermal energy resources in the planning area, the BLM compared the extent to which each alternative and the Proposed RMP would condition the development of fluid minerals; geothermal energy is managed as a fluid mineral. The BLM assumed that leasable stipulations with major constraints, such as no surface occupancy, would negatively affect, though not entirely preclude, the potential for geothermal development on BLM-administered lands.

Background

Although Oregon has yet to achieve commercial generation of electricity from geothermal energy, the potential exists. A U.S. Department of the Interior report identifies 7 sites within Oregon as having the highest geothermal potential out of 35 sites on public lands throughout the country (Kirby *et al*. 2003). Among these sites only the area within and in the immediate surroundings of Klamath Falls is within the planning area.

Affected Environment

There is no current geothermal development occurring on BLM-administered lands within the planning area. Geothermal potential exists in Oregon; however, it is primarily located in the eastern portion of the State. Some potential exists in the southern part of the State on the eastern border of the planning area of this RMP (USDI BLM and USDA FS 2008, p. I-9).

The BLM has applied no surface occupancy stipulations to 692,100 acres of BLM-administered lands.

Environmental Consequences

The alternatives and Proposed RMP would impose requirements for fluid mineral stipulations on differing acreages of BLM-administered lands within the planning area. The differing arrangement in each alternative and the Proposed RMP of ACECs, RMAs, Suitable Wild and Scenic Rivers, and Wilderness Areas drives these differences. **Table 3-216** compares acres for which the BLM would require stipulations across the alternatives and the Proposed RMP. It is important to note that while the No Action alternative acreage includes only acres to which the BLM has applied no surface occupancy stipulations, the action alternatives and the Proposed RMP acreages include all areas the BLM has identified as requiring stipulations. These stipulations include minor constraints, such as timing provisions, and major constraints, such as no surface occupancy.

Table 3-216. Acres that would have leasable stipulations

Criteria	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
Leasable stipulations	692,100*	190,389	211,638	318,915	498,525	246,747

* This includes only no surface occupancy acres.

Under all action alternatives and the Proposed RMP, the BLM would substantially reduce the acreage requiring leasable mineral stipulations compared to the No Action alternative. Alternative A would have the least acreage requiring stipulations. Thus, all action alternatives and the Proposed RMP would be less constraining to geothermal development than the current condition.

Issue Considered but Not Analyzed In Detail

How would management alternatives affect the development of solar radiation as a sustainable energy source?

In the joint BLM-USDOE analysis, NREL could not demonstrate a potential for solar energy development to be a notable sustainable energy resource on BLM-administered lands in the planning area (USDI BLM and USDOE 2003, pp. 13–14, 19–20, A2–A3, E9). The BLM did not assess the effects on solar energy because of the lack of commercial prospects on the BLM-administered lands in the planning area.

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