IV.10 PALEONTOLOGICAL RESOURCES

IV.10.1 Approach to Impact Analysis

IV.10.1.1 General Methods

The programmatic analysis presented herein discusses the potential impacts to paleontological resources from implementing the Desert Renewable Energy Conservation Plan (DRECP or Plan) alternatives. As noted in Volume III, Chapter III.10, significant paleontological resources within the Plan Area (and for transmission required outside the Plan Area) are predominantly associated with pre-Holocene (older than 10,000 years) geologic units that are of sedimentary origin, with certain exceptions.

Appendix R2.10 includes 13 tables supporting the impact analysis in this chapter. The tables present impact acreages for each alternative according to the Potential Fossil Yield Classification (PFYC) of geologic units within the Plan Area (see Volume III, Chapter III.10). The tables in Appendix R2.10 include two tables for each alternative—one that presents Plan-wide impacts, and one that presents a subset of those impacts specific to Bureau of Land Management (BLM) land under the Land Use Plan Amendment (LUPA).

IV.10.1.1.1 Terms and Definitions

There are several important terms used throughout this chapter, whose definitions are derived from the federal Paleontological Resources Preservation Act (Title VI, Subtitle D of the Omnibus Public Land Management Act of 2009) and the implementing guidelines developed by BLM (Instruction Memorandum [IM] 2009-011):

- The term *paleontological resource (or fossil)* means "any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth" (16 U.S.C. 470aaa).
- *Paleontological locality*, *location*, or *site* refers to a "geographic area where a paleontological resource is found. Localities, locations, and sites may be as small as a single point on the ground or as large as the area of an outcrop of a formation in which paleontological resources are found" (BLM IM 2009-011).
- A *significant paleontological resource* is a paleontological resource that is scientifically important for one or more of the following reasons: "(1) It is a rare or previously unknown species, (2) it is of high quality and well-preserved, (3) it preserves a previously unknown anatomical feature or other characteristic, (4) it provides new information about the history of life on earth, or (5) it has identified educational or recreational value" (BLM IM 2009-011).

- A *geologic unit*, as used in this chapter, refers to rocks or loose sedimentary deposits that can be grouped based on common characteristics, such as age, physical characteristics, and origin. Geologic units may be delineated at a statewide, regional, or local scale and may refer to sedimentary, igneous, or metamorphic rocks.
- A *fossiliferous (or fossil-bearing) geologic unit* refers to any geologic material, unit, or formation known to contain fossils based on museum collection records, published scientific literature, and/or other maps and reports.
- The *fossil-yield potential* of a geologic unit or formation is a measure of the likelihood that a specific geologic unit or formation will contain paleontological resources.
- *Taphonomy* is the study of the processes such as burial, decay, and preservation that affect animal and plant remains as they become fossilized.

It is possible for fossils not to have scientific importance, especially if they "lack provenience or context, lack physical integrity because of decay or natural erosion, or are overly redundant or are otherwise not useful for research" (BLM IM 2009-011). Fossils and/or paleontological localities associated with any cultural item or archeological site are more appropriately considered and analyzed in the context of cultural resources (i.e., under the National Historic Preservation Act and the Archaeological Resources Protection Act).

IV.10.1.1.2 Analysis Approach

This chapter qualitatively analyzes potential impacts to paleontological resources based on:

- The general distribution of known fossil localities and the fossil-yield potential of the geologic units underlying the Plan Area.
- The location, extent, and depth of construction-related land disturbances that typically occur from development of various renewable energy technologies (i.e., solar, wind, and geothermal) and transmission options.
- The degree to which unintended increases in public accessibility due to development of access roads and/or transmission infrastructure could encourage unauthorized-collection activities, theft, and/or vandalism.
- The effectiveness of resource avoidance/minimization measures proposed as part of the DRECP and required under existing regulations.

These factors are examined together to describe the context (e.g., localized, regional, or subregional), intensity (e.g., negligible, minor, moderate, or severe), duration (e.g., short-term, long-term, or permanent), and type (e.g., beneficial or adverse) of impact. Because of the nature of the resource, potential impacts are generally localized and permanent in the absence of appropriate mitigation measures. The intensity of impacts

depends on the quantity and significance of paleontological resources encountered. Because fossils are primarily underground, the intensity of impacts may not be known until a project begins construction.

Determinations of the uniqueness or significance of paleontological resources can only be made by qualified, trained paleontologists familiar with the fossil(s) under consideration. Therefore, in circumstances where no significant fossil localities are already known to occur within the physical footprint of development (either through museum collections records, published scientific literature, or preconstruction surveys), actual impacts may only truly be known once a fossil is uncovered and identified. The definition of a significant paleontological resource has one basic assumption: that any fossil in question has been identified to a reasonably precise level, preferably to the level of genus or species. Therefore, all fossils newly uncovered on a site must always be treated as potentially significant until they are examined by a qualified paleontologist (Scott and Springer 2003). This caveat is why Covered Activities under the DRECP (and particularly activities involving subsurface disturbance) are discussed in this document in terms of their *potential* to impact paleontological resources.

The quantitative analysis of potential impacts presented in Section IV.10.3, Impact Analysis by Alternative, is based on a preliminary assessment of the PFYCs of geologic units underlying the Plan Area. The sources consulted, methods used, and results of the preliminary PFYC ratings for the Plan Area are described in detail in Volume III, Chapter III.10. Definitions for individual PFYCs are provided in Volume III, Table III.10-1. For the purpose of this analysis, PFYCs are grouped into three categories based on the level of management concern and the type of assessment and mitigation actions that could be required:

- **Low/Very Low (LVL):** PFYC Classes 1 and 2. Management concern is low, and assessment and mitigation are only required in rare circumstances. Even in such cases, the estimated PFYC must be confirmed at a local level, and it must be demonstrated that there are no known paleontological localities in the affected area (e.g., through a record search and literature review).
- **Moderate/Unknown (MU):** PFYC Class 3. Management concern is either moderate or cannot be determined from existing data. A written assessment would be required; and, depending on the potential for impacts, a paleontological field survey and report would be needed. Further action, including project redesign and/or a monitoring and mitigation plan, may be required depending on the results of the written assessment and field survey. Because of the initial lack of information, areas of unknown potential may be reassigned to a different PFYC after further investigation.
- **High/Very High (HVH):** PFYC Classes 4 and 5. Management concern is high to very high. The probability of impacts to significant paleontological resources is moderate

to high, depending on the proposed action (e.g., extent and depth of disturbance). A field survey by a qualified paleontologist is likely needed to assess local conditions, and special management actions may be needed.

Using Geographic Information Systems, the proposed Development Focus Areas (DFAs) for each alternative were evaluated according to the extent to which they intersect geologic units with various PFYCs. It was presumed that DFAs that cover more area underlain by geologic units with an HVH PFYC are more likely to adversely impact significant paleontological resources than those underlain by geologic units with an LVL PFYC. This quantitative impact analysis was performed at the Plan-wide level and by ecoregion subarea. Ecoregion subareas were considered an appropriate geographic unit for paleontological resource evaluation because their boundaries generally coincide with important geologic and geomorphic transitions.

IV.10.1.1.3 Scope of Analysis

The DRECP broadly defines DFAs for each of the alternatives but does not identify specific locations or detailed designs for renewable energy development. Accordingly, this analysis presents a broad-level view of potential impacts on paleontological resources, based on a preliminary coarse-scale estimate of the PFYCs- of the geologic units underlying the Plan Area, as well as the general location and significance of known paleontological localities and sites (see Volume III, Chapter III.10). As they are proposed, individual renewable energy projects seeking approval from land management agencies would be required to re-evaluate paleontological resources at a project level of detail. Project-specific impacts would be assessed during the permitting process and in supplemental California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documents, including a re-evaluation of the PFYC of underlying geologic units using the best available geologic data.

The presence (or the potential presence) of paleontological resources within the Plan Area is highly variable and depends upon numerous factors that are most appropriately examined at a local level. Site-specific information needs to be collected to define paleontological resources and their significance for individual locations and project proposals. Such information includes (1) the nature and distribution of geologic units and their general fossil-yield potential, (2) whether institutional collections have recorded fossil specimens on the site (or regionally within the same geologic units), (3) whether there is published scientific literature pertaining to the site or its underlying formations, and (4) whether preconstruction surveys of the site or similar geologic units have yielded fossils. In addition, the probability for individual renewable energy projects to have adverse impacts on paleontological resources, and the extent and magnitude of those impacts, depends upon the specific loca-

tion, layout, technology, and design of the projects, as well as the effectiveness of avoidance/minimization measures to be required.

IV.10.1.2 CEQA Standards of Significance

CEQA Guidelines Appendix G has established the following standard for use in determining the significance of impacts on paleontological resources from a proposed action or project:

- Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Two other significance standards provided within the CEQA Guidelines (attached to the geology and hydrology issue areas) do not explicitly mention paleontological resources but are relevant nonetheless:

- Would the project result in substantial soil erosion or the loss of topsoil?
- Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off site?

These standards are relevant because accelerated erosion or loss of topsoil could remove paleontological resources, if present, from their original context and damage their integrity though fragmentation and dispersal. Excessive sediment deposition down gradient of renewable energy and transmission development could also bury fossils exposed at the surface. These processes occur naturally under existing conditions, so fossil erosion, transport, or burial are only characterized as impacts to the extent that Covered Activities change or accelerate the rate of said processes.

CEQA relies on lead agencies to provide their own definitions, guidance, and/or thresholds related to paleontological resource impacts. Accordingly, discretionary actions on nonfederal lands within the Plan Area would require lead agencies to analyze individual project proposals according to their own thresholds and guidelines. In the absence of universally accepted significance standards, beyond Appendix G, for impacts, there is little consistency among state and local agencies in their approaches to analyzing potential impacts on paleontological resources. Some nonfederal agencies with jurisdiction in the Plan Area—such as Riverside, San Diego, and San Bernardino counties—have incorporated into their use permitting processes requirements to protect paleontological resources. Other lead agencies rely solely on Appendix G and/or significance standards developed by others, such as the Society of Vertebrate Paleontology or federal land management agencies such as BLM, the National Park Service, or the U.S. Forest Service.

Although there are no universal guidelines for the assessment and mitigation of paleontological resources, there is also no major disagreement or controversy among agencies on fundamental terms and concepts related to paleontological resources. Although many of the definitions in Section IV.10.1.1.1, Terms and Definitions, are derived from federal statutes and apply specifically to federal land, their definitions are not less detailed or otherwise in fundamental conflict with the basic concept of paleontological resources as used by state and local agencies. Accordingly, this analysis assumes that a "unique paleontological resource" referred to in the CEQA Guidelines Appendix G is equivalent to a "significant paleontological resource" as defined in Section IV.10.1.1.1. Further, this analysis applies the procedural guidance developed by BLM globally to the whole Plan Area (regardless of jurisdiction) because it is equivalent to or more stringent than rules applied by local and state agencies under CEQA. For example, local agencies that apply the Society of Vertebrate Paleontology guidelines to paleontological resources under CEQA often place less importance on invertebrate fossils or microfossils compared with the BLM guidance.

IV.10.2 Typical Impacts Common to All Action Alternatives

The following general discussion identifies typical impacts on paleontological resources within the Plan Area that are common to all alternatives. An adverse impact on paleontological resources would occur if any of the Covered Activities would result in the loss, damage, or destruction of any unique or significant paleontological resource. This includes any fossil that has one or more of the following characteristics: (1) It is a rare or previously unknown species, (2) it is of high quality and well-preserved, (3) it preserves a previously unknown anatomical feature or other characteristic, (4) it provides new information about the history of life on earth, or (5) it has identified educational or recreational value. Because the distribution of known fossil localities and the fossil-yield potential of the geologic setting is a site-specific consideration, this discussion focuses on the nature and magnitude of ground-disturbing activities for various phases of renewable energy development and for different types of renewable energy technology. The fossil-yielding potential of geologic units underlying the DFAs and the planned distribution of renewable energy technologies will be the focus of the alternative-specific analysis.

Paleontological resources are nonrenewable and, once damaged or destroyed, cannot be recovered or replaced. Therefore, if Covered Activities result in the loss, damage, or destruction of a significant paleontological resource, this scientific resource would become irretrievable. Data recovery and resource removal are ways in which at least some information can be salvaged should a paleontological resource or site be affected, but certain contextual data would invariably be lost. The discovery of otherwise unknown fossils would be beneficial to science and the public good but only as long as sufficient data (including stratigraphic and taphonomic information and high quality and representative specimens) can be collected and recorded. Ultimately, the extent and magnitude of potential impacts to

paleontological resources depend upon the resources discovered, if any, and the effectiveness of mitigation measures.

IV.10.2.1 Impacts of Renewable Energy and Transmission Development

IV.10.2.1.1 Impacts of Site Characterization

Preconstruction site characterization activities—including installation of meteorological towers, completion of soil borings, and installation of temporary access roads—generally have the same types of impacts as those described for the construction and decommissioning phases (see Section IV.10.2.1.2, Impacts of Construction and Decommissioning). However, site characterization activities have a lower probability of adversely impacting paleontological resources due to the temporary, minor, and dispersed nature of ground disturbance that would be required, especially when compared with activities associated with facility construction and decommissioning.

Site reconnaissance and survey activities as well as geotechnical exploration are required for all Covered Activities regardless of the renewable energy technology employed; and thus, the potential impacts of those activities are similar across technologies. Any potential impacts from surface-disturbing activities can typically be mitigated by carrying out pedestrian surveys prior to the activity. Pedestrian surveys for paleontological resources serve to identify and collect data for both known and previously unknown fossils, if present. Site characterization activities that do not disturb subsurface geologic materials include site reconnaissance, species-specific surveys, and, if on flat ground, establishment of temporary unpaved access routes. Because exposure of paleontological resources is usually limited to rock outcrops and/or stream-cut slopes, the potential for these types of activities to adversely impact paleontological resources would be minimal.

Geotechnical testing activities, while common to all alternatives, would vary in the scope and specific techniques used and would depend upon the size of the facility and the technology employed. Since the goal of geotechnical exploration is to identify geologic materials and their properties, it is typically favorable to use techniques that minimize disturbance to the soil and the subsurface stratigraphy (so that drill cores can be adequately observed or tested). These techniques typically include use of small-diameter direct-push borings or hollow stem augers, especially for sites that are underlain by poorly consolidated sediments (which describes most DFAs in all alternatives). The retrieval of significant paleontological resources from geotechnical borings is extremely unlikely since the boreholes are usually just several inches in diameter and in the tens of feet deep. However, in the unlikely event these borings encounter a fossil, it is possible that stratigraphic and taphonomic information would be preserved due to the nondestructive nature of the sampling. Paleontological monitoring of geotechnical activities could provide additional information about the depth and

extent of subsurface fossil-bearing geologic units and thus could be used to focus the scope of construction-phase monitoring and mitigation activities.

There are certain site characterization activities uniquely associated with wind energy generation projects, including installation of temporary meteorological stations and the construction/use of temporary access roads, which could require a somewhat greater degree of land disturbance and excavation compared with other technologies. This is because areas favorable for wind energy generation are more hilly. Temporary access roads within hills are more likely to be longer and to require greater excavation volumes since such roads must navigate the topography and make cuts into sloped areas to maintain a flat surface. Such cut slopes tend to create fresh exposures of previously subsurface geologic units.

Geothermal energy projects are associated with particular site characterization activities involving well-field testing. Well-field testing is necessary to determine resource viability and to optimally site geothermal production and injection wells. Geothermal test wells (e.g., temperature gradient wells or stratigraphic wells) typically require the use of boreholes that are much larger in diameter than geotechnical borings and must utilize truck-mounted rotary or diamond core rigs. These drilling techniques are considered destructive from a paleontological resource perspective because they tend to pulverize the soil or rock and involve the use of fluids to lubricate the drill head. For these reasons, paleontological monitoring of such activities is impractical because it is nearly impossible to recover intact fossils during geothermal well testing, if present.

IV.10.2.1.2 Impacts of Construction and Decommissioning

The bulk of potential impacts to paleontological resources for all technologies would typically occur during the excavation and earth-moving phases of construction. The greatest degree of excavation would be associated with site preparation, including installation of access roads/spur roads, installation of utility and drainage infrastructure, and grading/excavation for facility foundations. Drainage and flood control features could include ditches, canals, detention/evaporation ponds, and other structures necessary to divert or direct flows across a site. Installation of subsurface utilities would involve linear trenching, and construction of aboveground transmission and power lines would require large-diameter auguring. Transportation, utility, and drainage infrastructure are all essential elements of facility construction regardless of the renewable energy resource being developed, and all involve excavations with the potential to unearth paleontological resources.

The volume of earth moving required for site preparation generally depends upon the size of the site, how flat it needs to be to support the specific energy technology, and the foundation requirements associated with any operation and maintenance buildings and produc-

tion facilities. Solar energy technologies to varying degrees require level terrain, so the volume of grading and earth moving required can be substantial if, for example, solar facilities are proposed on sites that are not already flat. Excavations for wind turbine foundations are also substantial, as are excavations for motor-pier foundations, transmission mono-pole foundations, pylons, and certain solar array construction pads. Such excavations tend to be highly localized compared with the widespread grading used for general site preparation, but such excavations penetrate the ground surface more deeply. Deeper excavations (beyond 1 or 2 feet) could encounter fossil-yielding units even if the surface is mapped as having a low paleontological potential.

For the most part, construction activities can be accomplished using conventional earth-moving equipment (e.g., tractors, backhoes, and graders), which allows for mitigation of potential impacts to below a level of significance through monitoring. Professional paleontologists and approved paleontological monitors typically carry out mitigation programs by examining new exposures of soil and rock created during excavation, grading, and trenching. Monitoring of conventional excavations can result in the identification and salvage of fossils that may otherwise not have been unearthed or discovered as the result of natural processes. With mitigation, these newly exposed fossils become available for scientific research, education, display, and preservation into perpetuity at museums. It is important to recognize that in addition to potential adverse impacts on paleontological resources, renewable energy and transmission development in the Plan Area can result (and has resulted) in beneficial gains in specimen collections and scientific research that would not have otherwise occurred.

Similar to certain site characterization activities (i.e., geothermal well testing), certain construction methodologies preclude the possibility of adequately identifying, evaluating, and recovering fossils, if present. These include pile driving, destructive boring, and possibly blasting. Pile driving can range in intensity from simple installation of a fence post to emplacement of deep load-bearing foundations. All of these activities could crush or otherwise disturb subsurface fossils, if present. Placing deep foundations can also involve large-diameter rotary borings that can pulverize subsurface soil and rock and render pre-existing fossils unrecognizable, if present. In certain cases, however, these large-diameter borings can also generate large intact blocks of sedimentary rock matrix that can and often do contain intact fossils. The most prominent examples of destructive boring techniques that exhume large volumes of soil and rock would be the construction of power tower foundations (which must support a structure hundreds of feet tall) and the installation of deep geothermal injection and production wells. Wind towers also require deeply augured foundations due to the height and wind-loading requirements of modern wind turbines. The destructive auguring required for solar photovoltaic and solar thermal technologies (other than power tower) is comparatively minor.

Construction activities could also indirectly impact paleontological resources via hydrologic effects and increased public access. These are the same types of impacts as described for the construction and decommissioning phases (see Section IV.10.2.1.2); the only difference is that the duration of impact would be short-term and restricted to the construction phase.

The decommissioning phase of renewable energy and transmission projects would generally result in the same types of impacts as discussed for construction, but the impacts would be lesser in magnitude for two reasons. First, the ground disturbance required to decommission a site is generally significantly reduced compared with installation requirements, in part because certain underground components can be abandoned in place as long as surface soils are restored. Second, decommissioning activities would occur in areas previously disturbed and within soils previously reworked for the purpose of original facility construction (e.g., trench backfills, foundational soils). The potential to uncover paleontological resources within these types of soils would be negligible.

IV.10.2.1.3 Impacts of Operations and Maintenance

During long-term operation of energy projects, unintended increases in public accessibility can result due to establishment of access roads, corridors, or facilities in otherwise intact and inaccessible areas. This access can increase unauthorized-collection activities, theft, and/or vandalism of resources. The passage of the Paleontological Resources Preservation Act in 2009 made theft of fossils from federal land a criminal offense. Increased human access (including off-highway vehicle [OHV] use) exposes paleontological sites to a greater probability of impact from a variety of stressors. Effective mitigation for the loss of paleontological resources by vandalism and unlawful collecting (poaching) resulting from increased accessibility of public lands can be difficult to implement. Such impacts can be greatly reduced by increasing public awareness about the scientific importance of paleontological resources through education, community partnerships, and interpretive displays and by informing the public about penalties for unlawful destruction or unlawful collection of these resources from public lands.

Operations and maintenance of renewable energy and transmission development can also result in the loss, damage, or destruction of near-surface paleontological resources and their stratigraphic context to the extent that the development changes existing patterns of erosion and sedimentation or accelerates the natural rate of erosion and soil loss. Such degradation occurs both within the project footprint and in areas downslope or downstream. Agents of erosion and sedimentation include wind, water, and downslope movements by gravity, all of which are naturally occurring but can be influenced by development. In most cases, such adverse effects cannot be entirely avoided but can be substantially minimized through proper drainage design; installation of temporary and permanent water quality

best management practices; on-site retention of surface flows; and minimizing disturbance, clearance, or compaction of natural soils and vegetation to the maximum extent feasible (see also Chapter IV.4, Geology and Soils).

The extent to which erosion would impact paleontological resources could differ based on the renewable energy technology developed:

- Solar generation projects have the broadest range of potential impacts in terms of area needs and extent of ground disturbance, as well as concentrated effects since most development requires vegetation mowing/clearing and possibly some grading for the solar collector arrays, which in some cases can approach or exceed 1 or more square miles in size. Within that large a project area, it would be difficult to avoid disturbance of washes and other hydrologic features. Indirect impacts to paleontological resources would thus be more severe for solar energy development than other renewable energy technologies.
- Wind energy projects are normally vast in terms of project area requirements (installation of roads, wind turbine towers, switchyards, and associated facilities), but the actual ground disturbance is less than that of solar energy projects. Wind energy development also may be more flexible when it comes to the project layout and can thus more easily reduce risk from exposure to flooding and avoid sensitive resources such as surface water bodies.
- Geothermal energy development affects a smaller area, so ground disturbance is less than that of solar and wind energy development. Geothermal energy development is normally limited to the power plant site, roads, and linear facilities for steam and water supply, steam condensation reinjection, wastewater, and transmission lines. In addition, the linear facilities associated with such projects can follow alignments that minimize effects to sensitive resources including surface water bodies and exposure to flood hazards.

Cleaning, maintenance, repair, and replacement of access roads and spur roads for all renewable energy technologies and transmission would result in periodic, localized, and shallow soil disturbances. However, the potential impacts of access road maintenance on paleontological resources would be minimal for the same reason as discussed for decommissioning activities (see Section IV.10.2.1.2). Namely, such disturbance would occur in areas previously disturbed and within soils previously reworked for the purpose of original road construction.

IV.10.2.2 Impacts of the Reserve Design

Impacts on paleontological resources from conservation actions would be beneficial to the extent that existing levels of public access and/or ground-disturbing activity could be reduced or eliminated (e.g., closing OHV routes). Conservation strategies to preserve and protect vegetation communities or species habitat in most cases would likewise protect paleontological resources. Because extensive development would be prohibited in the reserve areas, paleontological resources would be protected from disturbance resulting from grading, construction activities, pedestrian and motor-vehicle access, and/or accelerated rates of erosion (caused by development). Plan-wide Conservation and Management Actions (CMAs) would require that the siting and design of Covered Activities maintain the function of natural surface water processes, groundwater processes, hydrogeomorphic processes, and hydrologic regimes. Maintaining the functions would also minimize the potential for fossils to be eroded, transported, or otherwise buried as a result of human activity.

Conservation actions may occasionally require on-the-ground surveys, invasive species control, vegetation and pest management, or other light ground-disturbing activities to achieve biological goals and objectives. However, these conservation actions would not require grading or substantial earth moving; and any ground disturbances required would be highly localized, minor in extent, and limited to the surface. Impacts of Covered Activities under the reserve design with respect to paleontological resources would thus be negligible.

IV.10.2.3 Impacts of BLM Land Use Plan Decisions

IV.10.2.3.1 Impacts of Renewable Energy Development and Transmission on BLM Lands

The typical impacts from the various renewable energy and transmission technologies on BLM lands would be the same as those described in Section IV.10.2.1, Impacts of Renewable Energy and Transmission Development. However, the specific locations in which energy and transmission development will be allowed will be driven by LUPA decisions, which may encourage or restrict development in some areas.

IV.10.2.3.2 Impacts of BLM Land Designations and Management Actions

Because the BLM LUPA land designations would be managed to protect ecological, historic, cultural, scenic, scientific, and recreation resources and values, they would also confer general protection for paleontological resources. While other land uses are allowed within these areas, other uses must be compatible with the resources and values that the land designation is intended to protect. Protective land use designations such as Areas of Critical Environmental Concern (ACECs), National Landscape Conservation System (NLCS) lands,

wildlife allocations, and closed OHV management areas would have beneficial impacts by protecting known and unknown paleontological resources.

Expansion or designation of new ACECs, Special Recreation Management Areas (SRMAs), and National Scenic and Historic Trail (NSHT) Management Corridors, to the extent that they allow an increase in public accessibility or new/expanded open OHV areas, could adversely impact paleontological resources at the ground surface. New and expanded SRMAs could expose fossil-bearing geologic units, if present, to adverse impacts from soil compaction, vehicle ground disturbance, or unauthorized collecting. However, because land designation and management actions would be designed to consider many resource values, localized increases in potential paleontological resource impacts from new or expanded SRMAs would be countered by Plan-wide CMAs and protective designations elsewhere. Authorized recreation activities and trail management actions would occur in a manner that minimizes potential adverse effects to paleontological resources from soil erosion or disturbance. For example, SRMAs containing significant paleontological resources would continue to limit or prohibit OHV use or staging, provide interpretational and directional signage, and prohibit renewable energy development. Additionally, paleontology CMAs for BLM lands in the entire DRECP Area would be implemented as applicable (discussed in this chapter by alternative).

Known, nationally significant paleontological resource areas that would continue to be protected from any adverse impacts from development or uncontrolled public access include:

- The Mountain Pass dinosaur track way ACEC, which contains the only known occurrence of fossilized Mesozoic reptile tracks in California. Such tracks are a rare occurrence in the United States.
- The Yuha Basin ACEC, which contains eroded badlands exposing portions of the Imperial Formation known for its well-preserved Pliocene (4 to 5 million years old) oyster shell beds and other marine fossils.
- The Rainbow Basin ACEC, which has provided and continues to provide scientists with valuable fossil evidence of terrestrial life during the middle Miocene (12 to 16 million years ago).
- The Manix paleontological area ACEC, which contains extensive exposures of pluvial lake sediments deposited during the Pleistocene (20,000 to 1 million years ago) that preserve fossils of a wide variety of terrestrial and aquatic vertebrate animals.
- Coyote Mountains fossil site ACEC, which contains richly fossil-bearing marine strata of the Imperial Formation that document the initial flooding of the proto-Gulf of California during the late Miocene and early Pliocene (4 to 6 million years ago).

- The Marble Mountain fossil bed ACEC, which contains ancient Paleozoic (250 to 540 million years old) strata that preserves some of the earliest records of complex marine life in California, as well as a rich record of the subsequent diversification of marine ecosystems that occurred later in the Paleozoic Era.

Some of the alternative-specific reserve designs provide enhanced protection through inclusion of some of these areas in NLCS lands, though none of the alternatives include actions that would increase the potential for impacts beyond existing conditions. Details on allowable uses and management within National Conservation Lands are presented in the proposed LUPA description in Volume II. Details on the goals, objectives, allowable uses, and management actions for each ACEC and SRMA unit information are in the LUPA worksheets in Appendix H.

IV.10.2.4 Impacts of Natural Community Conservation Plan and General Conservation Plan

The Natural Community Conservation Plan (NCCP) would be administered by the California Department of Fish and Wildlife (CDFW) and would be applicable to the entire Plan Area. The General Conservation Plan (GCP) would be administered by the U.S. Fish and Wildlife Service and would be applicable to nonfederal lands, a subset of the entire Plan Area.

IV.10.2.4.1 Natural Community Conservation Plan

The impacts of renewable energy development permitted under the NCCP would be the same as those defined for the Plan-wide impacts, including the typical impacts described in Section IV.10.2, Typical Impacts Common to All Action Alternatives, and for each alternative described in this chapter.

IV.10.2.4.2 General Conservation Plan

The types of impacts resulting from renewable energy development permitted under the GCP would be the same as those defined for the Plan-wide impacts, including the typical impacts described in Section IV.10.2. However, the locations of these impacts would vary by alternative. Any differences in these impacts because of the locations are described for each alternative.

IV.10.3 Impact Analysis by Alternative

The following sections present impact analysis for the No Action Alternative, the Preferred Alternative, and Alternatives 1 through 4. Because this is a programmatic document, it does not evaluate site-specific impacts associated with particular projects. Project-specific

impacts on paleontological resources would be assessed during the permitting process and in supplemental CEQA and NEPA documents.

IV.10.3.1 No Action Alternative

This section presents the Plan-wide assessment of impacts and mitigation measures for renewable energy and transmission development for the No Action Alternative. The No Action Alternative assumes that the state will achieve its renewable energy goals in support of greenhouse gas reduction targets. It further assumes that the contribution of the DRECP Area to the state goals under the No Action Alternative would be similar to the Preferred Alternative and other alternatives. Unlike the Preferred Alternative and other alternatives, the No Action Alternative does not include an integrated, interagency conservation strategy for Covered Species and natural communities throughout the California deserts. It also does not include specific DFAs; instead, it assumes a future renewable energy technology mix and spatial distribution similar to current development patterns at the ecoregion subarea scale.

IV.10.3.1.1 Impacts within the Entire Plan Area in No Action Alternative

For the No Action Alternative, the ground disturbance and project area impacts from renewable energy and transmission development would occur on a project-by-project basis in a pattern similar to past and ongoing renewable energy development as described in Volume II, Chapter II.2.

IV.10.3.1.1.1 Impacts and Mitigation for Renewable Energy and Transmission Development in No Action Alternative

Impact Assessment

Impact PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources.

Land disturbance associated with site characterization, construction, and decommissioning activities under the No Action Alternative would generally reflect a continuation of current trends and recent patterns of renewable energy development associated with existing and planned projects. For example, allowable development and policies under the Solar Programmatic Environmental Impact Statement (PEIS) (e.g., Solar Energy Zones and Variance Lands) would continue; and renewable energy and transmission development outside of existing Legislatively and Legally Protected Areas and ACECs would continue to occur ad-hoc on a case-by-case basis and in accordance with existing land management plans and policies. These include requirements to obtain local conditional use permits (terms vary), California Desert Conservation Area (CDCA) plan amendments, California Energy Commis-

sion conditions of certification, and other special authorizations. The analysis of potential impacts to paleontological resources under the No Action Alternative therefore considers all area outside of Legislatively and Legally Protected Areas, ACECs, existing urban and built-up lands, military lands, and SRMAs as potentially developable. Wind energy generation is emphasized in the West Mojave and Eastern Slopes ecoregion subarea; solar energy generation is emphasized in the Cadiz Valley and Chocolate Mountains and the Imperial Borrego Valley ecoregion subareas; and geothermal energy generation is emphasized in the Imperial Borrego Valley ecoregion subarea.

The nature and intensity of paleontological resource impacts from renewable energy and transmission development under the No Action Alternative would be the same as described in Section IV.10.2, but the location and extent of impacts would differ somewhat from the Preferred Alternative and Alternatives 1 through 4. Table R2.10-1 (in Appendix R2) presents the estimated Plan-wide paleontological resource impacts by ecoregion subarea based on the general distribution of geologic formations (and their PFYCs) within developable areas, as well as the estimates of permanent disturbance presented in Volume II, Chapter II.2. Key impacts would occur as follows:

- The greatest degree of impact would be within the Cadiz Valley and Chocolate Mountains ecoregion subarea, where 40,000 acres could experience permanent disturbance, 28% of which (11,000 acres) could occur within areas with an HVH PFYC. This potential to impact sensitive units is also the greatest compared with all of the other ecoregion subareas.
- The ecoregion subarea with the next greatest impact to HVH PFYCs would be the Imperial Borrego Valley ecoregion subarea; ground disturbances in this region could affect 20,000 acres, 19% of which (4,000 acres) would be within HVH PFYCs.
- Approximately 21%, 61%, and 16% of all developable areas considered in aggregate are underlain by geologic formations with an HVH, MU, and LVL PFYC, respectively. (The balance consists of water bodies.)

Although these map-based findings are merely estimates based on coarse-scale regional geologic data, they are consistent with recent fossil discoveries associated with current renewable energy development within both ecoregion subareas. Examples of existing projects that have been approved or are under construction include the Palen Solar Electric Generating System (solar power tower), Genesis Solar Power Project (solar trough), Desert Sunlight Solar Farm Project (solar photovoltaics), Ocotillo Wind Energy Facility (wind), and the East Brawley Geothermal Facility.

New information about the distribution and significance of paleontological resources in the Mojave and Colorado deserts has been focused on several areas (California Energy Commission 2013), as described in the following paragraphs.

Chuckwalla Valley and the Palo Verde Mesa. There has been an influx of paleontological information associated with the large renewable energy projects proposed and under construction in the Chuckwalla Valley and the Palo Verde Mesa area. Originally, the low number of fossil discoveries in the project vicinity was interpreted as an indication of low paleontological potential. However, paleontological field surveys and construction monitoring associated with these large projects in the past decade have consistently identified significant paleontological resources in both surface and subsurface contexts. For example, during construction of the Genesis Solar Energy Project, paleontological monitors discovered multiple occurrences of vertebrate fossils, primarily tortoise carapaces and limb bones.

Similarly, initial studies conducted for the nearby Desert Sunlight Project originally deemed the site to be of low probability for encountering vertebrate fossils (low potential). However, with the commencement of construction-related excavation work, several specimens (identifiable fragments or individual bones) and numerous unidentifiable fragments have been discovered. The identifiable species include bones of saber tooth cat (*Smilodon* sp.), deer (*Cervidae*), camel (*Camelidae*), and rodents (*Rodentia*), as well as desert tortoise (*Gorpherus* sp.). The results of these recent studies suggest that the Chuckwalla Valley has greater paleontological potential than originally thought (BLM 2013).

Furthermore, multiple studies have identified paleosols (ancient soil horizons) within the Quaternary alluvium of the region. These horizons formed slowly through mechanical and chemical erosion and weathering in the Colorado Desert during wetter periods of the Late Pleistocene (~13,000 years ago). These conditions are favorable for the preservation of fossils, especially short-lived species such as rodents. These paleosols have been identified below desert pavement in the southern Chuckwalla Valley, south of Interstate 10 near State Route 177 (BLM 2013), and at the Rio Mesa Solar Energy Generating Facility site (no longer proposed). In the paleontological assessment prepared for the former Rio Mesa project, it was found that at least two paleosols occur between 6 and 7 feet below the modern ground surface of the Palo Verde Mesa. Survey-related fieldwork resulted in the discovery of several rare, unique, and well preserved vertebrate fossil specimens, including a clutch of unhatched desert tortoise eggs intact in a burrow accompanied by an adult tortoise—the specimen may be the only such fossil ever found in California (URS 2011, 2012).

Borrego Valley and Salton Trough. Fieldwork associated with assessment of the paleontological resource potential of the Ocotillo Wind Project resulted in the discovery of vertebrate fossil remains of camel (*Camelidae*) and pond turtle (*Emydidae*) now curated in the Colorado Desert District Stout Research Center collection and recorded several fossil sites

where specimens were not collected (Aaron and Kelley 2011). Where exposed on the margins of the Salton Trough, like the deposits near Salt Creek and west of State Route 86 (Jefferson 2005), or encountered in excavations, like those at La Quinta and Indio (Whistler et al. 1995a, b, Paleo Environmental Associates Inc. 2010), later Pleistocene and Holocene deposits of ancient Lake Cahuilla have yielded significant invertebrate and vertebrate fossils in this region (Bowersox 1972). Other examples of specific geologic units known to have yielded significant paleontological resources include late Miocene to early Pliocene (~4 to 6 million years old) marine strata of the Imperial Group, as well as Pliocene to early Pleistocene (~4 to 1.5 million years old) terrestrial strata within sedimentary rocks of the Palm Spring Group.

Renewable energy and transmission development under the No Action Alternative could continue to impact sensitive formations in a manner consistent with the projects discussed above. As discussed in Section IV.10.2, certain excavation activities that disturb, damage, or destroy fossils without providing an opportunity to identify, study, and/or salvage them cannot always be mitigated using standard monitoring programs. These include predrilling and vibratory pedestal insertion, large-diameter boring with diamond cores, and other destructive excavation techniques, primarily associated with installation of deep pylons, piles, and/or shafts. Should such activities penetrate fossiliferous geologic formations, the potential for substantial adverse impacts on paleontological resources is greatly heightened.

Impact PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context.

Construction and operations activities under the No Action Alternative could increase the rate of erosion or soil loss or alter drainage patterns and result in impacts to paleontological resources. Without implementation of regulatory programs and implementation of proper design measures and best management practices, renewable energy and transmission development could exacerbate flooding, disrupt natural stream processes, and result in erosion and downstream transportation of soils (and any paleontological resources contained within them). The nature of these effects is described in greater detail in Section IV.10.2.

The potential for this type of impact to occur within the Plan Area would be proportional to the severity of hydrologic impacts discussed in Chapter IV.5, Flood, Hydrology and Drainage. The analysis presented therein indicates that solar energy development would have the greatest potential for adverse hydrologic and erosion impacts. Therefore, indirect impacts to paleontological resources may be greater in areas emphasizing solar development, such as the Cadiz Valley and Chocolate Mountains ecoregion subarea as compared with the West Mojave and Eastern Slopes and the Imperial Borrego Valley ecoregion subareas, which emphasize wind and geothermal. Substantial adverse impacts can be avoided or sufficiently

minimized by compliance with applicable laws, ordinances, regulations, and standards. These include implementation of stormwater pollution prevention plan design criteria, monitoring water quality and wastewater management, and Clean Water Act and related state and local agency compliance. To the extent these actions reduce impacts on hydrology, drainage, and erosion, they would also reduce impacts on paleontological resources.

Impact PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism.

Construction and operations activities under the No Action Alternative that allow increased human access to significant paleontological resources (whether intended or unintended) could result in indirect adverse impacts though unauthorized collection, looting, or vandalism. The nature and intensity of paleontological resource impacts from renewable energy and transmission development under the No Action Alternative would be the same as described in Section IV.10.2.

There is no concrete evidence that existing renewable energy development has increased unauthorized-fossil-collection activities; nevertheless, the continued development of access roads and transmission corridors associated with all renewable energy technologies could allow for public access to areas that were previously inaccessible. The areas currently being developed for renewable energy are already accessible by local roads and largely by unpaved OHV routes and maintenance roads that parallel overhead electrical lines. The potential for these types of impacts to occur would be greatest where transmission corridors would forge new paths into currently inaccessible terrain. However, because the No Action Alternative would maintain a development pattern that is consistent with what is currently occurring, the extent to which new areas would become accessible is minor compared with the other alternatives.

Furthermore, because renewable energy and transmission development would not generally be intended to provide public access (unless it interferes with an existing OHV route or other trail), individual projects would preclude public access to the actual generation facilities by installing perimeter fencing and signage. To restrict public access along private roads or transmission corridors, gates could be installed and signage could be posted to inform the public to remain on public roads and open OHV routes. Generally, those hobbyists and enthusiasts intent on collecting fossils would carry out such unauthorized activities regardless of the location and extent of renewable energy development. In the event fossils are actually uncovered as a result of construction, grading, and excavation, they would be protected under monitoring and mitigation programs, provided such a program has been implemented per project-specific mitigation.

Laws and Regulations

Existing laws and regulations may reduce the impacts of renewable energy development projects in the absence of the DRECP. Relevant regulations are presented in Volume III, Section III.10.1. Because this Environmental Impact Report/Environmental Impact Statement (EIR/EIS) addresses amendments to BLM's land use plans, these plans are addressed separately and are not included in this section. The requirements of relevant regulations may reduce impacts through the following mechanisms:

- *The Paleontological Resource Preservation Act* provides for (1) criminal and civil penalties for illegal sale and transport, and theft and vandalism of fossils from federal lands, (2) uniform minimum requirements for paleontological resource-use permit issuance (terms, conditions, and qualifications of applicants), (3) uniform definitions for "paleontological resources" and "casual collecting," and (4) uniform requirements for curation of federal fossils in approved repositories. Federal legislative protections for scientifically significant fossils apply to projects that take place on federal lands (with certain exceptions such as the Department of Defense, which continues to protect paleontological resources under the Antiquities Act), involve federal funding, require a federal permit, or involve crossing state lines.
- *The Federal Land Policy Management Act and NEPA* require that federal actions and land tenure adjustments that may impact or result in a loss of paleontological resources on public or split estate lands be evaluated and necessary mitigation be identified. Under NEPA, federal agencies are tasked with implementing specific guidelines for analyzing environmental effects. Under BLM's current guidelines, the PFYC system (BLM IM 2008-009) allows for a preliminary analysis of potential impacts. BLM IM 2009-011 (presented at the end of Appendix R2.10) outlines the requirements for scoping issues, assessing potential impacts, conducting paleontological field surveys, determining further mitigation requirements, field monitoring, and compliance monitoring and reporting.
- *California's Public Resources Code Section 5097.5* prohibits the willful excavation, removal, destruction, or injury to vertebrate paleontological sites, including fossilized footprints or any other paleontological feature situated on lands owned by, or under the jurisdiction of, the state; any city, county, district, authority, or public corporation; or any agency thereof.
- *Ordinance codes, general plan policies, and conditional use permit requirements* passed by certain cities and counties in the Plan Area include policies intended to protect the integrity of paleontological resources within their jurisdictions. Examples include San Diego, Riverside, and San Bernardino counties and the cities of San Diego, Carlsbad, Palmdale, and Chula Vista. Such zoning regulations and conditional

use permit requirements generally require project proponents to assess and mitigate for impacts to paleontological resources. Certain jurisdictions, such as San Diego County, have specific guidelines for determining the significance of paleontological resource impacts under CEQA.

Mitigation

The types of mitigation that have been adopted for approved projects are assumed to be the same as the mitigation that would apply in the future under the No Action Alternative. Mitigation for potential impacts typically involves the implementation of a paleontological resources monitoring and mitigation program. Specific terminology for such monitoring plans vary by managing agency, but they usually have the following elements in common:

- Qualification requirements for professional paleontologists and approved monitors
- Requirements for preconstruction surveys and salvage
- Construction phase monitoring of excavations, trenching, and other ground disturbances
- Procedures to follow in the event a significant resource is discovered
- Compliance monitoring and reporting procedures

Although preconstruction assessments of known paleontological resources, sites, or sensitive geologic units within the footprint of a project are typically completed as part of CEQA and/or NEPA compliance, these surveys are also generally included in mitigation requirements if insufficient data is available to properly assess and minimize potential effects. If the environmental analysis of a project finds that geologic units underlying a project site have a low fossil-yield potential, or if project disturbances would be limited to surface disturbances in previously disturbed areas, lead agencies have typically found the potential impacts to be negligible or minor. In such cases, lead agencies have either imposed unanticipated-discovery stipulations (whereby construction activities would cease in the vicinity of a potential fossil find until a qualified paleontologist can assess and mitigate for the find) or have not required mitigation at all.

As discussed in Section IV.10.1.2, CEQA Standards of Significance, there is variation in the manner in which state and local agencies manage and protect paleontological resources. For example:

- The East Brawley Geothermal Development Project EIR presented mitigation for potential impacts to paleontological resources using accidental-discovery provisions (i.e., if workers discover a fossil, stop work and call a qualified paleontologist) (PMC 2012). This EIR did not require worker training or active monitoring of excavation.

- On the opposite end of the spectrum, the Revised Staff Assessment for the Palen Solar Power Project (prepared by the California Energy Commission) included nine conditions of certification outlining extensive monitoring, mitigation, and compensatory measures to address paleontological resource impacts. One measure required the applicant to perform compensatory excavations and fossil collections if the applicant could not conclusively demonstrate that potential impacts from driven pylons to a subsurface fossil-yielding unit could not be avoided.

This wide range of approaches demonstrates varying levels of protection given to paleontological resources depending on the decision-making authority.

Broadly speaking, coordination between the project developer and the managing agency would be required for all renewable energy projects before areas are developed. The use of management practices (e.g., training/education programs to reduce the amount of inadvertent destruction to paleontological sites) could also reduce the occurrences of human-related disturbances to nearby sites. The specifics of these management practices would be established in project-specific coordination between the project developer and the managing agency. BLM IM 2009-011 provides operationally sound guidance for assessing potential impacts on paleontological resources and determining mitigation measures. California Energy Commission conditions of certification also provide strong examples of effective mitigation that could be employed by other managing agencies. Mitigation measures developed as part of the Solar PEIS, currently applicable only to Solar Energy Zones and Variance Lands, would also adequately protect paleontological resources.

However, there is some uncertainty as to whether typical practices are effectively protecting paleontological resources on a Plan-wide level. For example, there is evidence that current practices are not adequately identifying potentially fossil-bearing geologic units prior to project construction. Certain existing projects (discussed under Impact PR-1) have unexpectedly encountered fossil-bearing sediments in areas that were previously thought to have a low or moderate fossil-yield potential. Although lead agencies are required (under CEQA and/or NEPA) to evaluate the environmental impacts of discretionary projects and to impose mitigation for any significant impacts identified, federal agencies arguably have a stronger mandate to do so for paleontological resources specifically, due to federal legislative protections under the Paleontological Resources Preservation Act.

As evidenced by the East Brawley Geothermal Development Project EIR, CEQA lead agencies have frequently considered unanticipated-discovery measures to be adequate for projects underlain by Holocene-age basin deposits. Given that recent experiences have revealed that these may consist of a thin mantle over more sensitive units (e.g., paleosols), such mitigation measures may not be sufficient to adequately avoid or minimize potential impacts. Consequently, to the extent that Covered Activities would be within private versus

public lands, there could be some differences in the degree of scrutiny given to paleontological resources and in the effectiveness of proposed mitigation.

Mitigation of paleontological resource impacts can often provide significant public benefits. The science of paleontology is advanced by the discovery, study, and curation of new fossils. These fossils can be significant if they represent a new species, verify a known species in a new location, and/or include parts of similar specimens that had not previously been found preserved. In general, most fossil discoveries are the result of excavation, either purposeful in known or suspected fossil localities or as the result of excavations made during earthwork for civil improvements or mineral extraction. Such discoveries would not have been made without the construction activities that exposed them. Proper monitoring of excavation associated with continuing renewable energy development could result in fossil discoveries that would enhance our understanding of the fossil record or the past climate, geology, and geographic setting of the region for the benefit of current and future generations.

IV.10.3.1.1.2 Impacts from Reserve Design in the No Action Alternative

The No Action Alternative has no reserve design; but without approval of an action alternative, there would be continued protection of existing Legislatively and Legally Protected Areas such as wilderness areas. In addition, under the No Action Alternative, renewable energy projects would continue to be evaluated and approved with project-specific mitigation requirements. Any new mitigation or conservation lands approved on a project-by-project basis would be protective of paleontological resources, so long as the purpose of the mitigation land is for conservation of cultural, ecological, or habitat values. Impacts of the reserve design on paleontological resources would be negligible to nonexistent.

IV.10.3.1.2 Impacts on BLM Lands of Existing BLM Land Use Plans in No Action Alternative

Under the No Action Alternative, the existing land management plans within the Plan Area (CDCA Plan as amended, Caliente Resource Management Plan, and Bishop Resource Management Plan) would continue to be implemented on BLM lands. The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in the No Action Alternative would be the same as described in Section IV.10.3.1.1, Impacts Within the Entire Plan Area in No Action Alternative, but the location and extent of impacts would be restricted to BLM-administered land only.

Table R2.10-2 (in Appendix R2) presents the estimated BLM LUPA paleontological resource impacts by ecoregion subarea. Similar to the Plan-wide analysis, the Cadiz Valley and Chocolate Mountains ecoregion subarea would experience the greatest impacts, with an estimated 29,241 acres of potential land disturbance, 29% (8,517 acres) of which would be

within an HVH PFYC. Unlike the Plan-wide analysis, the Kingston and Funeral Mountains ecoregion subarea would have greater potential land disturbance than the Imperial Borrego Valley ecoregion subarea. However, BLM land in the Imperial Borrego Valley ecoregion subarea is located disproportionately on land with an HVH PFYC rating (2,962 acres, or 39% of the developable BLM land within the ecoregion subarea). Although the Kingston and Funeral Mountains ecoregion subarea would have greater footprint impacts overall, the footprint impacts of renewable energy development in the Imperial Borrego Valley ecoregion subarea would affect a large area of HVH PFYC.

Like the Plan-wide impacts, the impacts of BLM LUPA decisions (including right-of-way grants for renewable energy) can be avoided or minimized through implementation of typical measures imposed by BLM per BLM IM 2009-011.

IV.10.3.1.3 Impacts of Natural Community Conservation Plan in No Action Alternative

The NCCP would apply to all lands within the Plan Area. In the absence of Plan implementation, the NCCP would not be approved; and no incidental take permits would be issued under the NCCP. The appropriate lead agency would continue to consider projects individually. The impacts that would occur in the absence of the NCCP would be the same as those described in Section IV.10.3.1.1.1, Impacts and Mitigation for Renewable Energy and Transmission Development in No Action Alternative.

IV.10.3.1.4 Impacts of General Conservation Plan in No Action Alternative

As described in Appendix M, the GCP would apply to nonfederal lands in the Plan Area. In the absence of Plan implementation, the GCP would not be approved and no incidental take permits would be issued under the GCP. The appropriate lead agency would continue to consider projects individually. The impacts that would occur in the absence of the GCP would be the same as those described in Section IV.10.3.1.1.1 but would be specific to nonfederal lands.

IV.10.3.1.5 Impacts Outside of Plan Area in No Action Alternative

Additional transmission lines would be needed to deliver renewable energy to load centers (areas of high demand) outside the Plan Area. It is assumed that new Outside of Plan Area transmission lines would use existing transmission corridors between the Plan Area and existing substations in the more heavily populated areas of the state. Transmission line development occurs within long linear corridors that traverse all types of land uses, including urban areas with high-density residential and commercial land uses. The outside of Plan Areas through which new transmission lines might be constructed include the San

Diego, Los Angeles, North Palm Springs–Riverside, and Central Valley areas. These areas and corridors are described in Volume III, Section III.10.5.1.

IV.10.3.1.5.1 Impacts of Transmission Outside of Plan Area

Impact PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources.

Based on the underlying geology, maps of PFYCs would identify area of low to high potential for fossils to be present. During ground-disturbing activities—such as maintenance of unpaved access roads, transmission tower site preparation, and tower foundation construction—monitors would observe operations and check for evidence of paleontological resources that may be unearthed.

Impact PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context.

Ground disturbance on transmission lines is limited largely to tower sites, access roads, and construction yards. Contractors are required to address drainage and erosion as part of their stormwater pollution prevention plans. These plans would address any potential risk of increased erosion or change to drainage that would adversely affect paleontological resources.

Impact PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism.

In existing transmission corridors, little or no additional access would be created beyond what already exists. Therefore, access would not increase.

IV.10.3.1.5.2 Impacts of Existing BLM Land Use Plans Outside of Plan Area

Under the No Action Alternative, the existing BLM CDCA land use plan would continue to be implemented on CDCA lands. Under the No Action Alternative, renewable energy projects would still be developed through BLM's existing policies. Impacts on paleontological resources would be of the types described in Section IV.10.2.1, with similar mitigation measures being included on a case-by-case basis.

The existing land designations—such as existing protected areas, ACECs, and NSHTs—would continue to be managed to protect their associated values and resources. Paleontological resources would continue to be managed and protected according to the multiple-use classes within the CDCA and according to conditions and stipulations attached to individual appli-

cations for right-of-way grants. Some land-disturbing activities, if authorized by BLM, could be allowed according to BLM land use plans outside the Plan Area; but such actions would be subject to NEPA. Further, the guiding procedures for the management of paleontological resources and the assessment of potential impacts would continue to be the PFYC system (BLM IM 2008-009) and the assessment/mitigation guidelines (BLM IM 2009-011), respectively. Any potential impacts to paleontological resources would be highly scattered and would be avoided or minimized through implementation of BLM policies.

IV.10.3.1.6 CEQA Significance Determination: No Action Alternative

PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources. Land disturbance associated with site characterization, construction, and decommissioning activities under the No Action Alternative would generally reflect a continuation of current trends and recent patterns of renewable development associated with existing and planned projects. Renewable energy and transmission development under the No Action Alternative could continue to have potential impacts to sensitive formations in a manner consistent with existing projects that have already encountered significant resources. In addition, certain excavation activities that disturb, crush, or destroy fossils without providing an opportunity to identify, study, and/or salvage them cannot always be mitigated using standard monitoring programs. These include predrilling and vibratory pedestal insertion, large-diameter boring with diamond cores, and other destructive excavation techniques, primarily associated with installation of deep pylons, piles, and/or shafts.

Although mitigation measures under the No Action Alternative are assumed to be similar to those currently being implemented, there is evidence that current practices are not adequately identifying potentially fossil-bearing geologic units prior to project construction. There is enough uncertainty about the effectiveness of typical mitigation measures in the interior desert basins that the effects of certain renewable energy projects, particularly on nonfederal land (i.e., under CEQA), may remain potentially significant, even with implementation of typical mitigation.

PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context. Actions to avoid or minimize impacts on hydrology and erosion, as discussed in Chapter IV.4 (Geology and Soils) and Chapter IV.5 (Flood, Hydrology, and Drainage), would likewise reduce the potential for impacts to paleontological resources to a less than significant level. No mitigation is required.

PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism. Because renewable energy and transmission development would not generally be intended to provide public access (unless it interferes with an existing OHV route or other trail), individual projects would preclude public access to the actual generation facilities by installing perimeter fencing and signage. To restrict public access along private roads or transmission corridors, gates or other access barriers are typically installed and signage is typically posted (at least on BLM land) to inform the public to remain on public roads and open OHV routes. There is little data to support that unauthorized collection of significant paleontological resources occurs in renewable energy development areas, and casual collection (i.e., a handful) of common invertebrate fossils is allowed on BLM land.

Utility corridors under the No Action Alternative would generally follow existing utility lines and access roads. Any additional access provided by renewable energy development under the DRECP would consist of private easements that would be unauthorized for public use or would parallel or cross existing public roads or OHV routes. Additional public access (and the potential for an increase in the geographic extent of unauthorized-fossil-collection activities) would be minor and incremental in nature compared with existing conditions. In addition, collection of vertebrate and/or significant paleontological resources is only unauthorized on federal land. Therefore, the effects of such activities would be minor, and the impact is considered less than significant. No mitigation is required.

IV.10.3.2 Preferred Alternative

The Preferred Alternative includes DFAs (2,028,000 acres) and transmission corridors where approximately 170,000 acres of ground disturbance–related impacts and operations impacts would occur. The Preferred Alternative includes Future Assessment Areas (FAAs) and DRECP Variance Lands, and these areas are not considered impacted or conserved in this analysis. The Preferred Alternative also includes Special Analysis Areas (SAAs) that represent areas subject to special ongoing analysis to inform the designation that would be made for the area prior to the signing of a NEPA Record of Decision(s) and CEQA certification for the DRECP. The SAAs are known to have high value for renewable energy development, ecological and cultural conservation, and recreation. In the Preferred Alternative, these areas are not analyzed as impacted or conserved. The impact analysis for paleontological resources under the Preferred Alternative is provided in the following sections.

IV.10.3.2.1 Plan-wide Impacts of Implementing the DRECP: Preferred Alternative

This section provides the Plan-wide assessment of impacts from implementing the DRECP for the Preferred Alternative. This Plan-wide assessment addresses the impacts and mitiga-

tion measures from renewable energy and transmission development and impacts of the reserve design.

IV.10.3.2.1.1 Plan-wide Impacts and Mitigation Measures from Renewable Energy and Transmission Development

Impact Assessment

The following provides the Plan-wide assessment of impacts and mitigation measures for renewable energy and transmission development for the Preferred Alternative. Impacts are presented for each paleontological resources impact statement (i.e., PR-1 through PR-3).

Impact PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources.

The nature and intensity of paleontological resource impacts from renewable energy and transmission development under the Preferred Alternative would be the same as described in Section IV.10.2, but the location and extent of impacts would differ somewhat among alternatives. Table R2.10-3 (in Appendix R2) presents the estimated Plan-wide paleontological resource impacts by ecoregion subarea based on the general distribution of geologic formations (and their PFYCs) within DFAs, as well as the estimates of permanent disturbance presented in Volume II, Chapter II.3. The estimated footprint impacts shown in Table R2.10-3 do not include the disturbance from renewable energy transmission outside of the DFAs. However, the potential transmission corridors—while not located precisely—can roughly be expected to be underlain by geologic units with a PFYC distribution similar to that within the conceptual energy corridors. The distribution of PFYCs within conceptual energy corridors is 4%, 85%, and 7% for LVL, MU, and HVH, respectively.

Impacts for the Preferred Alternative are focused as follows:

- Plan-wide, approximately 10% of the DFAs of the Preferred Alternative are underlain by geologic units with an HVH PFYC, 85% of the DFAs are underlain by geologic units with an MU PFYC, and approximately 3% of the DFAs are underlain by geologic units with an LVL PFYC. (The remaining 2% consists of water bodies.)
- The greatest degree of footprint impacts would be within the Imperial Borrego Valley ecoregion subarea, where 57,000 acres could experience ground disturbances, 3% of which (2,000 acres) could occur within areas with an HVH PFYC.
- This potential to impact geologic units in the Imperial Borrego Valley ecoregion subarea with an HVH PFYC is relatively low compared with potential impacts in other ecoregion subareas, such as the Cadiz Valley and Chocolate Mountains and the West Mojave and Eastern Slopes ecoregion subareas (and compared with the Plan Area generally).

- The Cadiz Valley and Chocolate Mountains and the West Mojave and Eastern Slopes ecoregion subareas both have the next greatest potential footprint impacts, 29,000 acres and 40,000 acres, respectively. About 21% of the DFAs in the Cadiz Valley and Chocolate Mountains subarea and 14% of the West Mojave and Eastern Slopes ecoregion subarea are underlain by geologic units with an HVH PFYC.

Some of the DFAs for the Preferred Alternative are in areas known as vertebrate fossil-yielding geologic units. For example:

- In the Horned Toad Hills west of Mojave and east of Tehachapi and in the hills surrounding Tehachapi Valley (the West Mojave and Eastern Slope ecoregion subarea), portions of the DFAs are sited in areas underlain by known vertebrate fossil-bearing strata. These strata include the Horned Toad Formation and the Bopesta Formation, respectively.
- Certain DFAs in the Kingston and Funeral Mountains ecoregion subarea are in the Mountain Pass area near Interstate 15 (Mescal Range), which is underlain by known fossil-bearing Paleozoic and Mesozoic sedimentary rocks (e.g., Sultan Limestone, Bird Spring Formation, and Aztec Sandstone).
- In the area immediately northeast of Barstow and northwest of Daggett (Mojave and Silurian Valley ecoregion subarea), a portion of the DFAs is underlain by vertebrate fossil-bearing strata of the Barstow Formation.
- In the eastern San Felipe Hills (Imperial Borrego Valley ecoregion subarea) fossil-bearing strata of the Palm Spring Group and Brawley Formation occur in areas where DFAs associated with all action alternatives are sited.
- In the Palo Verde Valley area and adjacent Palo Verde Mesa (Cadiz Valley and Chocolate Mountains ecoregion subareas), DFAs associated with all five action alternatives are sited in areas underlain by known vertebrate fossil-bearing Pleistocene paleosols.

As indicated in Table R2.10-3 (in Appendix R2), many other areas may be underlain by fossil-yielding geologic units, but these provide examples specific to the Preferred Alternative.

This distribution of PFYCs within the DFAs indicates that in almost all circumstances—whether or not known paleontological resources are present—subsurface excavations associated with all technologies may impact geologic units that are potentially fossil-yielding. For example, although only 3% of the DFAs within the Imperial Borrego Valley ecoregion subarea are within areas mapped as having an HVH PFYC, the vast majority (90%) are within geologic units where the PFYC may be MU. Furthermore, since geothermal would be emphasized in the region, drill pad foundations, production facility foun-

dations, and especially the injection and production wells themselves may penetrate sensitive units at depth. Such issues would be project-specific considerations that would require remapping the paleontological potential at a finer level of detail using the best available information. Many of the areas mapped with an MU PFYC are likely to be assigned, at least partially, to a lower or a higher PFYC when examined at a finer scale.

Another important context to consider, besides the fossil-yield potential of the underlying geologic units, is that renewable energy development sited on land used or historically used for agriculture is typically less likely to result in adverse impacts on paleontological resources, even if the underlying PFYC is moderate or high. This is because agricultural activity disturbs the near-surface soils with repeated cycles of plowing, tilling, or ripping. Such soils are generally reworked to a depth of at least several feet. In these contexts, there is a reduced likelihood that intact, in situ fossils would be found. Under the Preferred Alternative, about a third (or 52,000 acres) of the estimated footprint impacts within DFAs would occur within land designated as agriculture in local general plans, almost all of which are within areas with a moderate or unknown PFYC. In these areas, the potential for adverse impacts on paleontological resources is limited to deeper soils; surface disturbances and light grading would generally have a very low probability of affecting any significant paleontological resources.

The DFAs proposed under the Preferred Alternative are geographically dispersed on both public and private lands. The large-scale geographic pattern of development at the ecoregion subarea and Plan-wide scales (i.e., clustered or dispersed) in and of itself matters little with respect to paleontological resources. Rather, what matters is whether and to what degree fossil-yielding geologic units are impacted, what the significance of those impacts are, and whether important or unique specimens/data can be collected/recovered. In addition, to the degree that solar energy development requires large-scale grading (e.g., if not sited in sufficiently flat areas), footprint impacts in areas emphasizing solar technology may be more widespread across the entire development footprint. Wind and geothermal development, while potentially requiring less widespread grading, would require deeper and wider foundations and may involve drilling and excavation techniques that make identification and recovery of impacted paleontological resources less likely.

Impact PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context.

The typical effects with respect to erosion and soil loss are described in greater detail in Section IV.10.2, though the location and extent of impacts for the Preferred Alternative would differ somewhat from the No Action and Alternatives 1 through 4. The potential for this type of impact to occur within the Plan Area would be proportional to the severity of

hydrologic impacts discussed in Chapter IV.5. The analysis presented therein indicates all renewable energy technologies could have adverse effects on the rate of erosion, soil loss, or drainage patterns but that solar energy development would have the greatest potential for adverse impacts. Therefore, indirect impacts to paleontological resources may be greater in areas emphasizing solar development, such as the West Mojave and Eastern Slopes and the Cadiz Valley and Chocolate Mountains ecoregion subareas as compared with the Pinto Lucerne Valley and Eastern Slopes, the Imperial Borrego Valley, and the Owens River Valley ecoregion subareas, which emphasize wind and geothermal.

Substantial adverse impacts can be avoided or sufficiently minimized by compliance with applicable laws, ordinances, regulations, and standards. These include implementation of stormwater pollution prevention plan design criteria, monitoring water quality and waste-water management, and Clean Water Act and related state and local agency compliance. To the extent these actions reduce impacts on hydrology, drainage, and erosion (see Chapters IV.4 and IV.5), they would also reduce impacts on paleontological resources.

Impact PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism.

The nature and intensity of paleontological resource impacts from renewable energy and transmission development under the Preferred Alternative would be the same as described in Section IV.10.2, but the location and extent of impacts would differ among the alternatives. Typically, renewable energy transmission and development that is further removed from existing roads and transmission infrastructure would have a greater potential to increase unauthorized collection or vandalism. Potential transmission corridors conceptually identified under the Preferred Alternative tend to follow existing major roads, highways, and utility corridors, which means that public accessibility to currently inaccessible areas would not change greatly. Otherwise, the impacts described under the No Action Alternative (see Section IV.10.3.1, No Action Alternative) would be the same as the unauthorized-collection or vandalism impacts of the Preferred Alternative.

Impacts in Study Area Lands

Study Area Lands refer to three categories of lands shown on alternative maps: FAAs, SAAs, and DRECP Variance Lands.

Future Assessment Areas. Lands within FAAs are neither reserve lands nor DFAs; they are simply areas that are deferred for future assessment. The future assessment will determine their suitability for renewable energy development or ecological conservation. If renewable energy development occurs on FAA lands, a Land Use Plan Amendment would not be required. FAAs for each alternative are included and located as shown in Table

IV.1-2 and Figure II.3-1 in Volume II. The FAAs represent areas where renewable energy development or inclusion in the reserve design could be implemented through an amendment to the DRECP, but additional assessment would be needed.

Because most of the FAAs are presented as "undesignated areas" in the action alternatives, there would be no difference between the FAAs in the Preferred Alternative except that renewable development in an FAA would not require a BLM Land Use Plan Amendment; so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the FAAs would impact paleontological resources in the same manner as discussed for the DFAs, with the potential for impacts increasing in areas assigned to higher PFYCs. In almost all circumstances—whether or not known paleontological resources are present—subsurface excavations associated with all technologies may impact geologic units that are potentially fossil-yielding. The distribution of PFYCs within FAAs for the Preferred Alternative is 60% LVL, 34% MU, and 6% HVH. This distribution is much more favorable compared with the DFAs, with a majority of the FAAs underlain by geologic units with low paleontological sensitivity.

Special Analysis Areas. There are two areas defined as SAAs, representing areas subject to ongoing analysis. These areas (located in the Silurian Valley and just west of U.S. Route 395 in Kern County) have high value for renewable energy development, ecological and cultural conservation, and recreation. SAA lands are expected to be designated in the Final EIR/EIS either as DFAs or included in the Reserve Design/Conservation Designation.

DRECP Variance Lands. DRECP Variance Lands represent the BLM Solar PEIS Variance Lands as screened for the DRECP and EIR/EIS based on BLM screening criteria. Covered Activities could be permitted for NCCP purposes only through an NCCP plan amendment. However, development of renewable energy on Variance Lands would not require a BLM Land Use Plan Amendment; so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the DRECP Variance Lands would impact paleontological resources in the same manner as discussed for the DFAs, with the potential for impacts increasing in areas assigned to higher PFYCs. The distribution of PFYCs within DRECP Variance Lands for the Preferred Alternative is 12% LVL, 59% MU, and 29% HVH. This distribution of PFYCs is skewed more toward high classes when compared with the potential impacts within DFAs. This is especially true of DRECP Variance Lands within the Cadiz Valley and Chocolate Mountains and the Piute Valley and Sacramento Mountains ecoregion subareas, where nearly 100% of the underlying land has an HVH PFYC.

Impact Reduction Strategies and Mitigation

Plan implementation would result in conservation of some desert lands as well as the development of renewable energy generation and transmission facilities on other lands. There are several ways in which the impacts of the renewable energy development covered by the Plan would be lessened. First, the Plan incorporates CMAs for each alternative, including specific biological reserve design components and LUPA components. Also, the implementation of existing laws, orders, regulations, and standards would reduce the impacts of project development. If significant impacts would still result after implementation of CMAs and compliance with applicable laws and regulations, then specific mitigation measures are recommended in this section.

Conservation and Management Actions

The conservation strategy for the Preferred Alternative (presented in Volume II, Section II.3.1.1) defines specific actions that would reduce the impacts of this alternative. The conservation strategy includes definition of the reserve design and specific CMAs for the Preferred Alternative. While the CMAs were developed for BLM lands only, this analysis assumes that all CMAs would be applied also to nonfederal lands.

The DRECP has one nonbiological CMA that would be directly applicable to paleontological resources; it includes the following requirements:

- If not previously available, require applicant to prepare paleontological sensitivity maps consistent with the PFYC for rights-of-way prior to NEPA analysis.
- Incorporate all guidance provided by the Paleontological Resources Protection Act.
- Ensure proper data recovery of significant paleontological resources where adverse impacts cannot be avoided or otherwise mitigated.
- Due to recent significant discoveries in areas within the Chuckwalla Valley where previous assessments had predicted low sensitivity, require paleontological surveys and construction monitors for large-scale projects.

In addition, certain Plan-wide biological CMAs proposed also help to avoid adverse impacts with respect to paleontological resources. These include worker education; resource setback standards; standard practices for siting and design, hydrology and water resources, and soil resources; and certain landscape-level biological CMAs:

- **AM-PW-14.** *Standard practices for siting and design* would implement designs that to the maximum extent feasible would confine disturbances, project vehicles, and equipment to the delineated project areas and prohibit, within project boundaries,

cross-country vehicle and equipment use outside of approved designated work areas. This CMA also restricts to the maximum extent feasible construction activity to the use of existing roads and utility corridors to minimize the number and length/size of new roads, laydown, and borrow areas. These standards would reduce the potential for adverse impacts to any paleontological resource at the surface due to incidental disturbances caused by vehicles and equipment. It would also minimize new areas of access and thus avoid or reduce the potential for unauthorized-collection activities to occur in new geographic areas.

- **AM-PW-5:** *Worker education programs* would provide workers with information on the legal protection for protected resources and penalties for violation of federal and state laws intended to protect site-specific biological and nonbiological resources. This type of program would reduce the potential for adverse impacts to any paleontological resource by informing workers of the legislative protections for paleontological resources (i.e., Paleontological Resources Preservation Act) so they will be better informed that fossils are an environmental resource and should not be vandalized, stolen, disturbed, or destroyed.
- **AM-PW-3:** *Resource Setback Standards* identify setbacks to avoid and buffer mapped riparian or wetland vegetation communities and the Federal Emergency Management Agency 100-year floodplain. Such setbacks would also be protective of paleontological resources, because the incised banks of washes and arroyos can occasionally expose fossils, or fossil-yielding geologic units. Avoiding development within these areas also avoids potential impacts to fossils, if present on the sides of incised banks.
- **AM-PW-9:** *Standard practices for hydrology and water resources* would require all Covered Activities to create a project-specific drainage, erosion, and sedimentation control plan that meets the approval of the appropriate DRECP Coordination Group. Among other things, the CMA includes measures to prevent excessive and unnatural soil deposition and erosion, design measures to maintain natural drainages and to reduce the amount of area covered by impervious surfaces, stabilization of disturbed areas, and regular inspections of permanent erosion control measures. These standards would reduce the potential for adverse impacts to paleontological resources because fossils (in addition to soils that contain them) can likewise be eroded and buried.
- **AM-PW-10:** *Standard practices for soil resources* would implement standard industry construction practices to minimize water and air erosion of soils and would require construction and installation techniques that minimize new site disturbance, soil erosion and deposition, soil compaction, disturbance to topography, and removal of vegetation. These standards would also reduce the potential for adverse impacts to paleontological resources.

Laws and Regulations

Similar to the No Action Alternative, existing laws and regulations will reduce certain impacts of Plan implementation. Relevant regulations are presented in the Regulatory Setting in Volume III. The requirements of relevant laws and regulations are summarized for the No Action Alternative in Section IV.10.3.1.1.1. There are no other laws or regulations that would uniquely apply to this alternative.

Mitigation Measures

The paleontology CMA and certain Plan-wide biological CMAs defined in this section (AM-PW3, AM-PW-5, AM-PW-9, AM-PW-10, and AM-PW-14), address some of the impact mechanisms identified for paleontological resources of the Preferred Alternative. A more in-depth discussion of mitigation measures is provided for the No Action Alternative in Section IV.10.3.1.1.1, and it is equally applicable to the Preferred Alternative.

Although the paleontology CMA includes measures for projects undergoing NEPA analysis, and implementation of the PFYC system, it is not specific enough nor does it appear to be applicable Plan-wide (i.e., on nonfederal lands). As discussed under the No Action Alternative, the effectiveness of assessment and mitigation measures for potential impacts to paleontological resources under CEQA is uncertain because agency management approaches vary considerably. A consistent approach to assessment and mitigation is needed to ensure that potential impacts do not go unrecognized or unmitigated and that the fossil-yield potential of surface and subsurface geologic deposits is fully understood. Thus, the following mitigation measure shall apply Plan-wide to the Preferred Alternative.

Mitigation Measures for Impact PR-1: Siting and construction of renewable energy and transmission development within the DRECP, regardless of jurisdiction, shall require the following measure to be implemented.

PR-1a **Protect Paleontological Resources.** In accordance with BLM IM 2009-11 the following steps should be taken:

- Project developers shall document in a paleontological resources assessment report whether paleontological resources exist in a project area on the basis of the following: the geologic context of the region and site and its potential to contain paleontological resources (including the PFYCs on site), a records search of institutions holding paleontological collections from California desert regions, a review of published and unpublished literature for past paleontological finds in the area, and coordination with paleontological researchers working locally in potentially affected geographic areas (or studying similar geologic strata).

- If the PFYC (or PFYCs) of the geologic units to be encountered during project construction has not been determined, the project developer shall use the best available data and field surveys, as applicable, to develop a site-specific map of the PFYC ratings. The PFYC map shall be at a scale equal to or more detailed than 1:100,000. Depending on the extent of existing information available and the sensitivity of the site, development of the resource assessment and PFYC map could require the completion of a paleontological survey.
- If paleontological resources are present at the site or if the geologic units to be encountered by the project (at the surface or the subsurface) have a PFYC Class of 3, 4, or 5, a Paleontological Resources Management Plan shall be developed. The elements of the plan shall be consistent with BLM IM 2009-11 and shall be prepared and implemented by a professional paleontologist as defined under Secretary of the Department of the Interior Standards. The plan shall include the following:
    - The qualifications of the principal investigator and monitoring personnel
    - Construction crew awareness training content, procedures, and requirements
    - Any measures to prevent potential looting, vandalism, or erosion impacts
    - The location, frequency, and schedule for on-site monitoring activities
    - Criteria for identifying and evaluating potential fossil specimens or localities
    - A plan for the use of protective barriers and signs, or implementation of other physical or administrative protection measures
    - Collection and salvage procedures
    - Identification of an institution or museum willing and able to accept any fossils discovered
    - Compliance monitoring and reporting procedures
    - The Paleontological Resources Management Plan shall also identify if all geologic units that would be affected by the project have been determined to be within an area with a PFYC Class of 1 or 2, the lead agency shall include paleontological resources as an element in construction worker awareness training and shall include measures to be followed in the event of unanticipated discoveries, including suspension of construction activities in the vicinity. The measure shall

stipulate that the site be protected from further earth moving or damage until a qualified paleontologist can assess the significance and importance of the find and until the fossil specimen or locality can be recorded and salvaged, if necessary.

- The Paleontological Resources Management Plan shall evaluate all of the construction methodologies proposed on a site, including destructive excavation techniques. Where applicable, the principal investigator shall include in the plan an evaluation of the potential for such techniques to disturb or destroy paleontological resources, an evaluation of whether loss of such fossils would represent a significant impact, and discussion of mitigation or compensatory measures (such as recordation/recovery of similar resources elsewhere on the site) that are necessary to avoid or substantially reduce the impact.

Mitigation Measures for Impact PR-2: None required. Actions to avoid or minimized impacts on hydrology and erosion, as discussed in Chapter IV.4 (Geology and Soils) and Chapter IV.5 (Flood, Hydrology, and Drainage), would reduce the potential for impacts to paleontological resources to an acceptable level.

Mitigation Measures for Impact PR-3: None required. Increased human access to significant paleontological resources could result in unauthorized collection or vandalism. However, the impact would be less than significant; in addition, Plan-wide siting and design CMAs also call for maximizing the use of existing roads and infrastructure so as to minimize new disturbances. No additional mitigation is required.

If these types of mitigation measures are implemented during the initial project design and planning phases and are adhered to throughout the course of development, the potential impacts on paleontological resources discussed under Section IV.10.2 would be minimized to the fullest extent possible. Adopting this approach does not mean that there would be no impacts on paleontological resources, but it does avoid substantial impacts to significant paleontological resources. The nature and magnitude of the impacts would vary from project to project and would need to be examined in detail in supplemental NEPA and CEQA reviews of site-specific projects.

IV.10.3.2.1.2 Impacts of the Reserve Design

The impacts of the reserve design collectively refer to the designation and management of existing protected areas (i.e., Legislatively and Legally Protected Areas and Military Expansion Mitigation Lands), BLM LUPA Conservation Designations (NLCS, ACECs, and wildlife allocations), and reserves established within Conservation Planning Areas. To the extent that such areas are newly established or expanded (i.e., beyond existing protected

areas), the reserve design would be considered a beneficial impact on paleontological resources, because renewable energy development would be precluded in these areas. Efforts to preserve wildlife, habitat, and ecologic values would likewise serve to protect paleontological resources. The Plan-wide distribution of PFYCs is 28%, 53%, and 18% for LVL, MU, and HVH, respectively. This generalized distribution of PFYCs within the reserve design indicates that in almost all circumstances—whether or not known paleontological resources are present—new or expanded reserve design elements would also serve to protect geologic units that are potentially fossil-yielding.

IV.10.3.2.2 Impacts of DRECP LUPA on BLM Land: Preferred Alternative

This section addresses two components of effects of the BLM LUPA: the streamlined development of renewable energy and transmission on BLM land under the LUPA and the impacts of the amended land use plans themselves.

IV.10.3.2.2.1 Impacts from Renewable Energy and Transmission Development on BLM Land

On BLM lands under the LUPA, the Preferred Alternative includes DFAs (370,000 acres) and transmission corridors where approximately 54,000 acres of ground disturbance–related impacts and operations impacts would occur.

Impact PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in the Preferred Alternative would be the same as described in the analysis of Plan-wide impacts, but the location and extent of impacts would be restricted to BLM-administered land only. In addition, when potential footprint impacts of the DFAs are examined in the context of BLM-administered land only, a relatively minor fraction of the affected area is underlain by agricultural land uses, which (at least within near-surface soils) normally minimize the potential for adverse impacts to paleontological resources, even in areas that are underlain by fossil-yielding geologic units. Under the DRECP LUPA, renewable energy development proposed on BLM lands within DFAs would be streamlined (i.e., permitted faster and with fewer steps). However, the speed or timing of renewable energy development ultimately does not affect the magnitude of potential impacts.

Table R2.10-4 (in Appendix R2) presents the estimated BLM LUPA paleontological resource impacts by ecoregion subarea. The estimated footprint impacts shown in Table R2.10-4 do not include the disturbance that could occur as a result of renewable energy transmission outside of the DFAs. However, the potential transmission corridors—while not located precisely—can roughly be expected to be underlain by geologic units with a PFYC distribution similar to that within the conceptual energy corridors. The distribution of PFYCs within

conceptual energy corridors is 4%, 85%, and 7% for LVL, MU, and HVH, respectively. With respect to DFAs, the Cadiz Valley and Chocolate Mountains ecoregion subarea would experience the greatest impacts, with an estimated 22,000 acres of potential land disturbance, 5,000 acres of which is within an HVH PFYC. The Imperial Borrego Valley ecoregion subarea would experience the next highest level of footprint impact, with 13,000 acres of potential footprint impacts within DFAs, 9% of which (1,100 acres) is within an HVH PFYC. The mix of renewable energy technology on BLM-administered land under the Preferred Alternative would be focused more on solar and geothermal, with the types of impacts being as described in the Plan-wide analysis (IV.10.3.2.1.1, Plan-wide Impacts and Mitigation Measures From Renewable Energy and Transmission Development) and the discussion of impacts typical to all alternatives (see Section IV.10.2.1).

Impact PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in the Preferred Alternative would be the same as described in the analysis of Plan-wide impacts (see Section IV.10.3.2.1.1), but the location and extent of impacts would be restricted to BLM-administered land only. The mix of renewable energy technology on BLM-administered land under the Preferred Alternative would be focused more on solar and geothermal, with the types of impacts being as described in the Plan-wide analysis (see Section IV.10.3.2.1.1) and the discussion of impacts typical to all alternatives (see Section IV.10.2.1).

Impact PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in the Preferred Alternative would be the same as described in the analysis of Plan-wide impacts (see Section IV.10.3.2.1.1), but the location and extent of impacts would be restricted to BLM-administered land only. The mix of renewable energy technology on BLM-administered land under the Preferred Alternative would be focused more on solar and geothermal, with the types of impacts being as described in the Plan-wide analysis (see Section IV.10.3.2.1.1) and the discussion of impacts typical to all alternatives (see Section IV.10.2.1).

IV.10.3.2.2.2 Impacts of Changes to BLM Land Designations

The BLM LUPA would establish Conservation Designations on BLM-administered lands under each alternative that would conserve biological resources. Changes to BLM land des-

ignations would include (1) the designation of new NLCS lands, (2) the designation of new ACECs and wildlife allocations and the expansion or reduction of existing ACECs, (3) the designation of new SRMAs and the expansion or reduction of existing SRMAs, (4) the creation of buffer corridors along NSHTs, and (5) the management of lands with wilderness characteristics to protect wilderness characteristics.

On BLM-administered lands under the Preferred Alternative, the BLM LUPA would designate approximately 4,931,000 acres of BLM LUPA Conservation Designations: 3,541,000 acres of NLCS lands, 1,372,000 acres of ACECs, and 18,000 acres of wildlife allocations. Additionally, existing conservation areas occur on BLM-administered lands that conserve biological resources. To the extent that such areas are newly established or expanded (i.e., beyond existing protected areas), such BLM land designations would be considered beneficial impacts for paleontological resources because renewable energy development would be precluded in these areas and because efforts to preserve wildlife, habitat, and ecologic values would likewise serve to protect paleontological resources. The Plan-wide distribution of PFYCs is 4%, 78%, and 18% for LVL, MU, and HVH, respectively. This distribution of PFYCs Plan-wide indicate that in almost all circumstances—whether or not known paleontological resources are present—new or expanded reserve design elements would serve to protect geologic units that are potentially fossil-yielding.

Expansion or designation of new ACECs, SRMAs, and NSHT Management Corridors, to the extent that they allow an increase in public accessibility or new/expanded open OHV areas, could result in adverse impacts to paleontological resources at the ground surface (no subsurface impacts). These would have the same effects as described under the No Action Alternative. Only the location and extent of SRMAs would change. Unit-specific SRMA worksheets are in Appendix L, and the CMAs specific to lands managed to protect wilderness characteristics are provided as part of the Volume II descriptions of the DRECP alternatives.

IV.10.3.2.3 Impacts of Natural Community Conservation Plan: Preferred Alternative

The analysis of Covered Activities under the NCCP is equivalent to the Plan-wide analysis of the interagency alternatives. Reserve design features and other conservation actions under the NCCP alternatives represent more detailed categories of the reserve design under the interagency Plan-wide alternatives. These NCCP differences in reserve design features do not affect nonbiological resources analyzed in this document; and the analysis of reserve design and conservation and management actions under the NCCP is therefore equivalent to the Plan-wide analysis of the interagency alternatives, as described in Section IV.10.3.2.1, Plan-wide Impacts of Implementing the DRECP: Preferred Alternative.

IV.10.3.2.4 Impacts of General Conservation Plan

On nonfederal lands under the GCP, the Preferred Alternative includes DFAs (1,600,000 acres) and transmission corridors where approximately 113,000 acres of ground disturbance–related impacts and operations impacts would occur. The impacts of the GCP for the Preferred Alternative would be similar to those defined in Section IV.10.3.2.1 for the Plan-wide analysis, but they would occur on nonfederal lands only.

IV.10.3.2.5 Impacts Outside of Plan Area

IV.10.3.2.5.1 Impacts of Transmission Outside of Plan Area

The impacts of Outside of Plan Area transmission on paleontological resources would be the same under all alternatives. These impacts are as described for the No Action Alternative in Section IV.10.3.1.5.1, Impacts of Transmission Outside of Plan Area.

IV.10.3.2.5.2 Impacts of BLM LUPA Decisions Outside of Plan Area

Under the proposed BLM LUPA, the only changes outside the Plan Area would be the designation of NLCS lands, ACECs, and NSHT Management Corridors, and Visual Resource Management Classes and new land allocations to replace multiple-use classes on CDCA lands. The nature and intensity of impacts on paleontological resources would be the same as those described in Section IV.10.3.1.5.2, Impacts of Existing BLM Land Use Plans Outside of Plan Area, though generally the impacts are limited to beneficial impacts associated with designation of NLCS lands, ACECs, and NSHT Management Corridors.

IV.10.3.2.6 CEQA Significance Determination for the Preferred Alternative

PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources. Land disturbance associated with site characterization, construction, and decommissioning activities under the Preferred Alternative, instead of continuing current trends and recent patterns of renewable development associated with existing and planned projects, would concentrate development into DFAs. The paleontology CMA and certain Plan-wide biological CMAs (AM-PW3, AM-PW-5, AM-PW-9, AM-PW-10, and AM-PW-14) partially address the impact mechanisms identified in Section IV.10.3.2.1.1. However, the paleontology CMA is not specific enough nor does it appear to be applicable Plan-wide (i.e., on nonfederal lands). For this reason, potential impacts to paleontological resources from renewable energy development on nonfederal lands could be potentially significant without additional mitigation. However, Implementation of Mitigation Measure PR-1a, as described in the Preferred Alternative (see Section IV.10.3.2.1.1) would ensure a consistent approach to assessment and mitigation and that the fossil-yield potential of the

surface and subsurface is fully understood prior to construction. Potential adverse impacts would be less than significant with implementation of Mitigation Measure PR-1a.

PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context. Actions to avoid or minimize impacts on hydrology and erosion that are integrated into the DRECP, as discussed in Chapter IV.5, would likewise reduce the potential for impacts to paleontological resources to a less than significant level (e.g., AM-PW-9 and AM-PW-10). No mitigation is required.

PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism. Because renewable energy and transmission development would not generally be intended to provide public access (unless it interferes with an existing OHV route or other trail), individual projects would preclude public access to the actual generation facilities by installing perimeter fencing and signage. To restrict public access along private roads or transmission corridors, gates could be installed and signage could be posted to inform the public to remain on public roads and open OHV routes. Because there is little data to support that unauthorized collection of significant paleontological resources occurs in renewable energy development areas, and because the effects of such activities would be minor and limited to surface exposures, the impact is considered less than significant. No mitigation is required.

IV.10.3.2.7 Comparison of the Preferred Alternative with No Action Alternative

Chapter IV.27 presents a comparison of all action alternatives and the No Action Alternative across all disciplines. This section summarizes the comparison of the Preferred Alternative with the No Action Alternative.

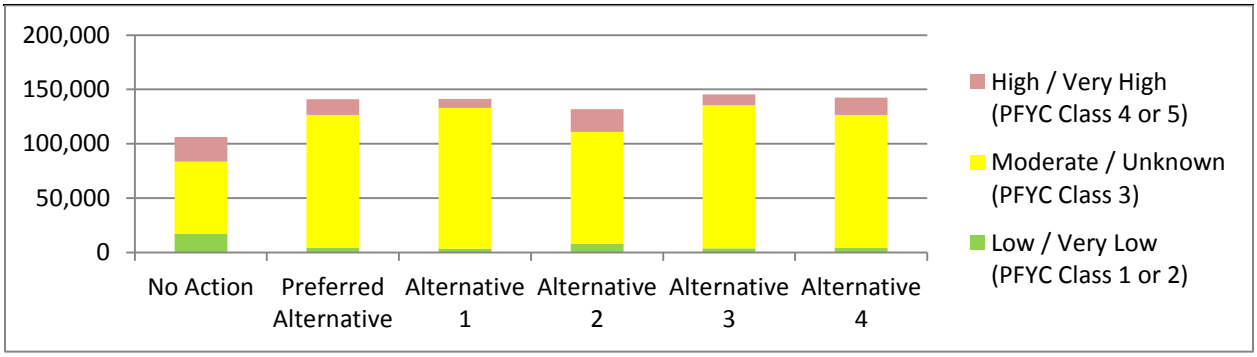
IV.10.3.2.7.1 Preferred Alternative Compared with No Action Alternative for Plan-wide DRECP

The Preferred Alternative would concentrate renewable energy development into approximately 2 million acres of DFAs (11% of the Plan Area) as compared with the more than 6 million acres (28% of the Plan Area) open to renewable energy development under the No Action Alternative. The DFAs are largely (87%) sited in areas of low terrestrial intactness, whereas only 60% of the areas open to renewable energy development under the No Action Alternative are in areas of low terrestrial intactness. The Preferred Alternative would conserve nearly 15 million acres of existing conservation areas, BLM LUPA Conservation Designations, and Conservation Planning Areas, whereas the No Action Alternative conserves just more than 10 million acres in existing protected areas and existing BLM Conservation Designations.

Renewable energy and transmission development under the Preferred Alternative could continue to have potential impacts to paleontologically sensitive geologic units in a manner consistent with existing projects that have already encountered significant resources, but such impacts would be concentrated in specific DFAs rather than dispersed Plan-wide across all developable areas. As the same renewable energy generation goals would be met under both the Preferred Alternative and the No Action Alternative, and only the geographic location of the development would change, the potential for impacts would increase or decrease only in terms of the geologic units affected (and their associated PFYCs).

Although the exact location of development would not be known until individual projects are proposed, the footprint impacts of the Preferred Alternative are less likely to be within geologic units with an HVH PFYC (about 14,400 acres) compared with the No Action Alternative (about 23,000 acres). As shown in Exhibit IV.10-1, the total extent of footprint impacts would be less under the No Action Alternative, but the amount of footprint impacts within HVH PFYCs would be lower under the Preferred Alternative. Furthermore, the Preferred Alternative concentrates development to a greater extent on agricultural lands (about a third of the DFAs), which decreases the potential for impacts to paleontological resources, at least within shallow soils (i.e., a few feet below the ground surface). Though the overarching analyses and conclusions under both alternatives with respect to paleontological resource impacts are similar, there would be less potential to impact paleontological resources under the Preferred Alternative. Implementation of Mitigation Measure PR-1a would ensure a consistent approach to assessment and mitigation and that the fossil-yield potential of the surface and subsurface is fully understood prior to construction. Under the No Action alternative, the consistency and effectiveness of paleontological resource assessment and mitigation on nonfederal land would remain uncertain.

Exhibit IV.10-1
Comparison of Plan-Wide Paleontological Resource Impacts by Alternative

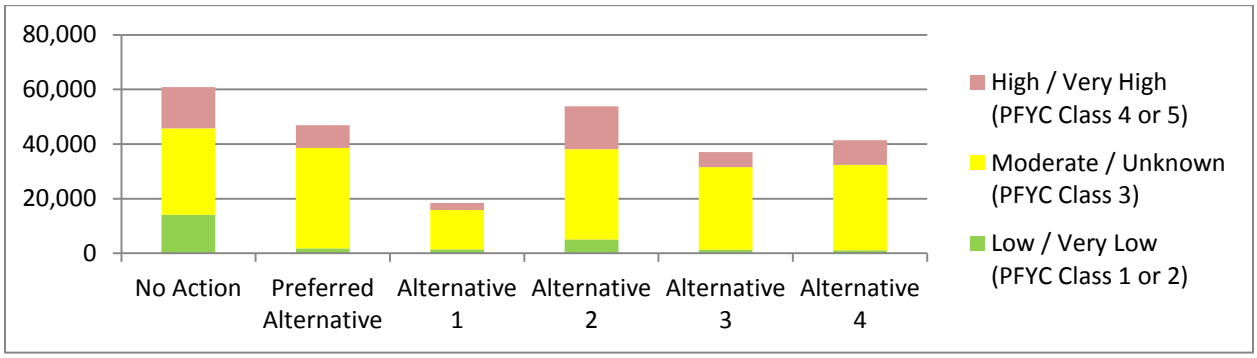


IV.10.3.2.7.2 Preferred Alternative Compared with No Action Alternative for the BLM LUPA

The Preferred Alternative would concentrate renewable energy development into approximately 370,000 acres of DFAs on BLM-administered lands as compared with the more than 2.8 million acres of BLM-administered lands considered open to renewable energy development under the No Action Alternative. Under the Preferred Alternative, the BLM LUPA would designate approximately 4.9 million acres of BLM LUPA Conservation Designations on BLM-administered lands: 3.5 million acres of NLCS lands, 1.4 million acres of ACECs, and more than 18,000 acres of wildlife allocations, as compared with approximately 2.4 million acres in existing ACECs on BLM-administered lands under the No Action Alternative. As shown in Exhibit IV.10-2, estimated footprint impacts under the No Action alternative on BLM-administered land would be about double those under the Preferred Alternative. Furthermore, a larger amount of geologic units with an HVH PFYC would be affected. Because the Preferred Alternative also includes a greater amount of Conservation Designations, paleontological resources would be protected over a wider geographic area.

Though the overarching analyses and conclusions under both alternatives with respect to paleontological resource impacts are the same, there would be slightly less potential to impact paleontological resources under the Preferred Alternative.

Exhibit IV.10-2
Comparison of BLM LUPA Paleontological Resource Impacts by Alternative



IV.10.3.2.7.3 Preferred Alternative Compared with No Action Alternative for NCCP

The impacts of the NCCP for the Preferred Alternative are the same as those defined in Section IV.10.3.2.1 for the Plan-wide analysis. As a result, the comparison of the Preferred Alternative with the No Action Alternative for the NCCP is the same as described above for the Plan-wide DRECP.

IV.10.3.2.7.4 Preferred Alternative Compared with No Action Alternative for the GCP

The Preferred Alternative would allow renewable energy development on approximately 1.6 million acres of DFAs on nonfederal lands as compared with the more than 3.4 million acres of nonfederal lands considered open to renewable energy development under the No Action Alternative. Under the Preferred Alternative, the Reserve Design Lands would include approximately 2.7 million acres on nonfederal lands, including 434,000 acres within existing conservation areas, 1.2 million acres within BLM LUPA Conservation Designations, and 1.1 million acres within Conservation Planning Areas. This compares with the No Action Alternative on nonfederal lands that includes 434,000 acres within existing conservation areas and 562,000 acres within existing BLM Conservation Designations. Because the GCP under the Preferred Alternative includes a greater amount of conservation compared with the No Action Alternative, paleontological resources would be protected over a wider geographic area.

IV.10.3.3 Alternative 1

The following sections provide the Plan-wide assessment of impacts and mitigation measures for renewable energy and transmission development for Alternative 1. Alternative 1 includes DFAs (1,100,000 acres) and transmission corridors where approximately 174,000 acres of ground disturbance–related impacts and operations impacts would occur. Alternative 1 includes DRECP Variance Lands, and these areas are not considered impacted or conserved in this analysis. Alternative 1 also includes geographically confined DFAs with a focus on private lands and emphasis on solar technologies in the Imperial Borrego Valley, Pinto Lucerne Valley and Eastern Slopes, and West Mojave and Eastern Slopes ecoregion subareas as well as geothermal in the Imperial Borrego Valley ecoregion subarea.

IV.10.3.3.1 Plan-wide Impacts of Implementing the DRECP: Alternative 1

This section provides the Plan-wide assessment of impacts from implementing the DRECP for Alternative 1. This Plan-wide assessment addresses the impacts and mitigation measures from renewable energy and transmission development and impacts of the reserve design.

IV.10.3.3.1.1 Plan-wide Impacts and Mitigation Measures from Renewable Energy and Transmission Development

Impact Assessment

Impact PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources.

The nature and intensity of paleontological resource impacts from renewable energy and transmission development under Alternative 1 would be the same as described in Section IV.10.2, but the location and extent of impacts would differ from the Preferred Alternative and Alternatives 2 through 4. Table R2.10-6 presents the estimated Plan-wide paleontological resource impacts by ecoregion subarea based on the general distribution of geologic formations (and their PFYCs) within DFAs, as well as the estimates of permanent disturbance presented in Volume II, Chapter II.3. The estimated footprint impacts shown in Table R2.10-6 do not include the disturbance that could occur as a result of renewable energy transmission outside of the DFAs. However, the potential transmission corridors—while not located precisely—can roughly be expected to be underlain by geologic units with a PFYC distribution similar to that within the conceptual energy corridors. The distribution of PFYCs within conceptual energy corridors is 3%, 83%, and 8% for LVL, MU, and HVH, respectively. (The remainder is mapped as water.)

Plan-wide, approximately 5% of the DFAs of Alternative 1 are underlain by geologic units with an HVH PFYC, 88% of the DFAs are underlain by geologic units with an MU PFYC, and approximately 2% of the DFAs are underlain by geologic units with an LVL PFYC. (The remaining 5% consists of water bodies.) The greatest degree of footprint impacts would be within the Imperial Borrego Valley ecoregion subarea, where 64,000 acres could experience ground disturbances, 3% of which (1,800 acres) could occur within areas with an HVH PFYC. This potential to impact geologic units with an HVH PFYC is relatively low compared with potential impacts in other ecoregion subareas, such as the Cadiz Valley and Chocolate Mountains (9%) and the Pinto Lucerne Valley and Eastern Slopes (18%) ecoregion subareas (and compared with the Plan Area generally). The West Mojave and Eastern Slopes and the Pinto Lucerne Valley and Eastern Slopes ecoregion subareas both have the next greatest potential footprint impacts, 37,000 acres and 13,000 acres, respectively. About 5% (2,000 acres) of the DFAs in the West Mojave and Eastern Slopes ecoregion subarea are underlain by geologic units with an HVH PFYC.

Some of the DFAs are in areas known as vertebrate fossil-yielding geologic units. In the eastern San Felipe Hills (Imperial Borrego Valley ecoregion subarea) fossil-bearing strata of the Palm Spring Group and Brawley Formation occur in areas where DFAs associated with all action alternatives are sited. In the Palo Verde Valley area and adjacent Palo Verde

Mesa (Cadiz Valley and Chocolate Mountains ecoregion subarea), DFAs associated with the all five action alternatives are sited in areas underlain by known vertebrate fossil-bearing Pleistocene paleosols. Alternative 1 is notable in that its DFAs appear to exclude known areas with vertebrate fossil-yielding geologic units that would be affected by other alternatives. These include (1) fossil-bearing strata of the Horned Toad Formation and the Bopesta Formation (West Mojave and Eastern Slopes ecoregion subarea), (2) vertebrate fossil-bearing strata of the Barstow Formation (Mojave and Silurian Valley ecoregion subarea), and (3) the Sultan Limestone, Bird Spring Formation, and Aztec Sandstone in the Mountain Pass area near Interstate 15 (Kingston and Funeral Mountains ecoregion subarea). As indicated in Table R2.10-6, many other areas may be underlain by fossil-yielding geologic units; but these provide examples specific to Alternative 1.

This distribution of PFYCs within the DFAs indicate that in almost all circumstances—whether or not known paleontological resources are present—subsurface excavations associated with all technologies may impact geologic units that are potentially fossil-yielding. As shown in Table R2.10-6, the vast majority of the footprint impacts within the DFAs (93%) would be in areas underlain by geologic units with an MU or HVH PFYC. On the other hand, about 42% of the DFAs within Alternative 1 would be sited on agricultural land. In these areas, the potential for adverse impacts on paleontological resources is limited to deeper soils; surface disturbances and light grading would generally have a very low probability of affecting significant paleontological resources.

Renewable energy development in all cases could adversely impact paleontological resources. However, the conservation strategy emphasis on avoidance in Alternative 1, in addition to the geographically confined DFAs with focus on private lands, results in a lesser potential for impacts compared with the other alternatives.

Impact PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context.

The typical effects with respect to erosion and soil loss are described in greater detail in Section IV.10.2, though the location and extent of impacts for Alternative 1 would differ somewhat from the Preferred Alternative and Alternatives 2 through 4. The potential for this type of impact to occur within the Plan Area would be proportional to the severity of hydrologic impacts discussed in Chapter IV.5. The analysis presented therein indicates all renewable energy technologies could have adverse effects on the rate of erosion, soil loss, or drainage patterns but that solar energy development would have the greatest potential for adverse impacts. Therefore, indirect impacts to paleontological resources may be greater in areas emphasizing solar development, such as the Imperial Borrego Valley, Pinto Lucerne Valley and Eastern Slopes, and West Mojave and Eastern Slopes ecoregion subareas.

Substantial adverse impacts can be avoided or sufficiently minimized by compliance with applicable laws, ordinances, regulations, and standards. These include implementation of stormwater pollution prevention plan design criteria, monitoring water quality and waste-water management, and Clean Water Act and related state and local agency compliance. To the extent these actions reduce impacts on hydrology, drainage, and erosion (see Chapters IV.4 [Geology and Soils] and IV.5 [Flood, Hydrology and Drainage]), they would also reduce impacts on paleontological resources.

Impact PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism.

The nature and intensity of paleontological resource impacts from renewable energy and transmission development under Alternative 1 would be the same as described in Section IV.10.2, but the location and extent of impacts would differ somewhat from the Preferred Alternative and Alternatives 2 through 4. Typically, renewable energy transmission and development that is further removed from existing roads and transmission infrastructure would have a greater potential to increase unauthorized collection or vandalism. Potential transmission corridors conceptually identified under Alternative 1 tend to follow existing major roads, highways, and utility corridors; and the DFAs, being more concentrated, may require fewer transmission corridors. This means that public accessibility to currently inaccessible areas would not change greatly. Otherwise, the impacts described under the No Action Alternative (see Section IV.10.3.1) would be the same as the unauthorized-collection or vandalism impacts of Alternative 1.

Impacts in Study Area Lands

Future Assessment Areas. There are no FAAs in Alternative 4.

Special Analysis Areas. Designating the SAAs as conservation would have no impact on this resource. Impacts would be the same as those explained for the Plan-wide reserve design.

DRECP Variance Lands. DRECP Variance Lands represent the BLM Solar PEIS Variance Lands as screened for the DRECP and EIR/EIS based on BLM screening criteria. Covered Activities could be permitted for NCCP purposes only through an NCCP plan amendment. However, development of renewable energy on Variance Lands would not require a BLM Land Use Plan Amendment; so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the DRECP Variance Lands would impact paleontological resources in the same manner as for the DFAs, with the potential for impacts increasing in areas assigned to higher PFYCs. The distribution of PFYCs within DRECP Variance Lands for Alternative 1 is 7% LVL, 66% MU, and 26% HVH. This distribution of PFYCs is skewed more toward high classes when compared with the potential

impacts within DFAs. This is especially true of DRECP Variance Lands within the Cadiz Valley and Chocolate Mountains and the Piute Valley and Sacramento Mountains ecoregion subareas, where the underlying land with an HVH PFYC is 97% and 68%, respectively.

Impact Reduction Strategies and Mitigation

Plan implementation would result in conservation of some desert lands as well as the development of renewable energy generation and transmission facilities on other lands. There are several ways in which the impacts of the renewable energy development covered by the Plan would be lessened. First, the Plan incorporates CMAs for each alternative, including specific biological reserve design components and LUPA components. Also, the implementation of existing laws, orders, regulations, and standards would reduce the impacts of project development. If significant impacts would still result after implementation of CMAs and compliance with applicable laws and regulations, then specific mitigation measures are recommended in this section.

Conservation and Management Actions

The conservation strategy for Alternative 1 (presented in Volume II, Section II.3.1.1) defines specific actions that would reduce the impacts of this alternative. The conservation strategy includes definition of the reserve design and specific CMAs for the Preferred Alternative. While the CMAs were developed for BLM lands only, this analysis assumes that all CMAs would be applied also to nonfederal lands.

The CMAs applicable to paleontological resources listed under the Preferred Alternative—which include (1) the paleontology CMA, (2) worker education, (3) standard practices for siting and design, (4) standard practices for hydrology and water resources, (5) standard practices for soil resources, and (6) certain landscape-level biological CMAs—would likewise apply to this alternative.

Laws and Regulations

Similar to the No Action Alternative, existing laws and regulations will reduce certain impacts of Plan implementation. Relevant regulations are presented in the Regulatory Setting in Volume III. The requirements of relevant laws and regulations are summarized above for the No Action Alternative in Section IV.10.3.1.1.1. There are no other laws or regulations that would uniquely apply to this alternative.

Mitigation Measures

After implementation of the CMAs and existing laws and regulations, mitigation measures will be applied to further reduce some of the DRECP's adverse impacts. The paleontology

CMA and certain Plan-wide biological CMAs (AM-PW3, AM-PW-5, AM-PW-9, AM-PW-10, and AM-PW-14) partially address the potential adverse effects identified previously. However, as under the Preferred Alternative, the paleontology CMA is not specific enough and does not clearly apply to nonfederal land. Implementation of Mitigation Measure PR-1a, as described in the Preferred Alternative (see Section IV.10.3.2.1.1) would ensure a consistent approach to assessment and mitigation and that the fossil-yield potential of the surface and subsurface is fully understood prior to construction.

IV.10.3.3.1.2 Impacts from Reserve Design

The impacts of the reserve design collectively refer to the designation and management of existing conservation areas (i.e., Legislatively and Legally Protected Areas and Military Expansion Mitigation Lands), BLM LUPA Conservation Designations, and reserves established within Conservation Planning Areas. Overall, of the 15,100,906 acres within the Alternative 1 Reserve Design Lands, 41% are within BLM LUPA Conservation Designations, 9% in the Conservation Planning Areas, and the remaining 51% in existing conservation areas. Of the BLM LUPA Conservation Designations under Alternative 1, 28% would be NLCS lands, 59% would be ACECs, and 13% would be wildlife allocations. The reserve design under Alternative 1 emphasizes the protection of Aeolian transport, riparian, and linkage areas in the Cadiz Valley and Chocolate Mountains ecoregion subarea, the U.S. Route 395 corridor, Fremont Valley, and Ridgecrest in addition to elements included in alternative-specific reserve design for the Preferred Alternative.

To the extent that such areas are newly established or expanded (i.e., beyond existing protected areas), the reserve design would be considered a beneficial impact on paleontological resources because renewable energy development would be precluded in these areas and because efforts to preserve wildlife, habitat, and ecologic values would likewise serve to protect paleontological resources. The Plan-wide distribution of PFYCs is 28%, 53%, and 18% for LVL, MU, and HVH, respectively. This generalized distribution of PFYCs within the reserve design indicates that in almost all circumstances—whether or not known paleontological resources are present—new or expanded reserve design elements would also serve to protect geologic units that are potentially fossil-yielding.

IV.10.3.3.2 Impacts of DRECP LUPA on BLM Land: Alternative 1

This section addresses two components of effects of the BLM LUPA: the streamlined development of renewable energy and transmission on BLM land under the LUPA and the impacts of the amended land use plans themselves.

IV.10.3.3.2.1 Impacts from Renewable Energy and Transmission Development on BLM Land

On BLM lands under the LUPA, Alternative 1 includes DFAs (81,000 acres) and transmission corridors where approximately 27,000 acres of ground disturbance–related impacts and operations impacts would occur.

Impact PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in Alternative 1 would be the same as described in the analysis of Plan-wide impacts, but the location and extent of impacts would be restricted to BLM-administered land only. In addition, when potential footprint impacts of the DFAs are examined in the context of BLM-administered land only, a relatively minor fraction of the affected area is underlain by agricultural land uses, which (at least within near-surface soils) normally minimize the potential for adverse impacts to paleontological resources, even in areas that are underlain by fossil-yielding geologic units. Under the DRECP LUPA, renewable energy development on BLM lands in DFAs would be streamlined (i.e., permitted faster and with fewer steps). However, the speed or timing of renewable energy development ultimately does not affect the magnitude of potential paleontological impacts.

Table R2.10-7 presents the estimated BLM LUPA paleontological resource impacts by ecoregion subarea. The estimated footprint impacts shown in Table R2.10-7 do not include the disturbance that could occur as a result of renewable energy transmission outside of the DFAs. However, the potential transmission corridors—while not located precisely—can roughly be expected to be underlain by geologic units with a PFYC distribution similar to that within the conceptual energy corridors. The distribution of PFYCs within conceptual energy corridors is 14%, 71%, and 15% for LVL, MU, and HVH, respectively. With respect to DFAs, the Imperial Borrego Valley ecoregion subarea would experience the greatest impacts, with an estimated 7,000 acres of potential land disturbance, 14% (1,000 acres) of which is within an HVH PFYC. The Cadiz Valley and Chocolate Mountains ecoregion subarea would experience the next highest level of footprint impact, with 4,000 acres of potential footprint impacts within DFAs, 17% of which (700 acres) is within an HVH PFYC. The mix of renewable energy technology on BLM-administered land under Alternative 1 would be focused more on solar and geothermal, with the types of impacts being as described in the Plan-wide analysis (IV.10.3.2.1.1) and the discussion of impacts typical to all alternatives (see Section IV.10.2.1).

Impact PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in Alternative 1 would be the same as described in the analysis of Plan-wide impacts (see Section IV.10.3.2.1.1), but the location and extent of impacts would be restricted to BLM-administered land only. The mix of renewable energy technology on BLM-administered land under Alternative 1 would be focused more on solar and geothermal, with the types of impacts being as described in the Plan-wide analysis (see Section IV.10.3.2.1.1) and the discussion of impacts typical to all alternatives (see Section IV.10.2.1).

Impact PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in Alternative 1 would be the same as described in the analysis of Plan-wide impacts (see Section IV.10.3.2.1.1), but the location and extent of impacts would be restricted to BLM-administered land only. The mix of renewable energy technology on BLM-administered land under Alternative 1 would be focused more on solar and geothermal, with the types of impacts being as described in the Plan-wide analysis (see Section IV.10.3.2.1.1) and the discussion of impacts typical to all alternatives (see Section IV.10.2.1).

IV.10.3.3.2.2 Impacts of Changes to BLM Land Designations

The BLM LUPA would establish Conservation Designations on BLM-administered lands under each alternative that would conserve biological resources (and thus incidentally paleontological resources), including NLCS lands, ACECs, and wildlife allocations. On BLM-administered lands under Alternative 1, the BLM LUPA would designate approximately 4,894,000 acres of BLM LUPA Conservation Designations: 1,493,000 acres of NLCS lands, 2,813,000 acres of ACECs, and 588,000 acres of wildlife allocations. BLM LUPA land designations emphasize ACECs and wildlife allocations, with less identification of lands with national-level resource values (i.e., NLCS lands).

To the extent that Conservation Designations are newly established or expanded (i.e., beyond existing protected areas), such BLM land designations would be considered beneficial impacts to paleontological resources because renewable energy development would be precluded in these areas and because efforts to preserve wildlife, habitat, and ecologic values would likewise serve to protect paleontological resources. The Plan-wide distribution of PFYCs is 28%, 53%, and 18% for LVL, MU, and HVH, respectively. This distribution of PFYCs Plan-wide indicates that in almost all circumstances—whether or not

known paleontological resources are present—new or expanded reserve design elements would serve to protect geologic units that are potentially fossil-yielding.

Under Alternative 1, the following scientific values associated with paleontological and geologic resources would not be included within NCLS lands (but they would be included in the Preferred Alternative):

- The Pisgah Crater—the NASA Mars analog site and unique invertebrate assemblage associated with the lava tubes
- The paleontological values associated with Rainbow Basin and the Manix area.
- The Carbonate Endemic Plant Research Natural Area ACEC, with its unusual geologic, soil, and plant association and habitat for threatened and endangered species.

However, the paleontological resources within these areas would continue to be protected in accordance with current policy; and there would be no DFAs proposed in these areas. Therefore, no adverse impacts on these areas would occur even if they are not designated under the NLCS.

Expansion or designation of new ACECs, SRMAs, and NSHT Management Corridors, to the extent that they allow an increase in public accessibility or new/expanded open OHV areas, could result in adverse impacts to paleontological resources at the ground surface (no subsurface impacts). These would have the same effects as described under the No Action Alternative. Only the location and extent of SRMAs would change. Unit-specific SRMA worksheets are in Appendix L, and the CMAs specific to lands managed to protect wilderness characteristics are provided as part of the Volume II descriptions of the DRECP alternatives.

IV.10.3.3.3 Impacts of Natural Community Conservation Plan: Preferred Alternative

The analysis of Covered Activities under the NCCP is equivalent to the Plan-wide analysis of the interagency alternatives. Reserve design features and other conservation actions under the NCCP alternatives represent more detailed categories of the reserve design under the interagency Plan-wide alternatives. These NCCP differences in reserve design features do not affect nonbiological resources analyzed in this document, and the analysis of reserve design and conservation and management actions under the NCCP is therefore equivalent to the Plan-wide analysis of the interagency alternatives, as described in Section IV.10.3.2.1.

IV.10.3.3.4 Impacts of General Conservation Plan

On nonfederal lands under the GCP, Alternative 1 includes DFAs (972,000 acres) and transmission corridors where approximately 143,000 acres of ground disturbance–related impacts and operations impacts would occur. The impacts of the GCP for Alternative 1 would be similar to those defined in Section IV.10.3.2.1 for the Plan-wide analysis, but they would occur on nonfederal lands only. The distribution of fossil-yielding geologic units would be broadly similar to the Plan-wide distribution, with impacts from DFAs and benefits from conservation roughly proportional as well.

IV.10.3.3.5 Impacts Outside of Plan Area

IV.10.3.3.5.1 Impacts of Transmission Outside of Plan Area

The impacts of Outside of Plan Area transmission on paleontological resources would be the same under all alternatives. These impacts are as described for the No Action Alternative in Section IV.10.3.1.5.1.

IV.10.3.3.5.2 Impacts of BLM LUPA Decisions Outside of Plan Area

Under the proposed BLM LUPA, the only changes outside the Plan Area would be the designation of NLCS lands, ACECs, and NSHT Management Corridors, and Visual Resource Management Classes and new land allocations to replace multiple-use classes on CDCA lands. The nature and intensity of impacts on paleontological resources would be the same as those described in Section IV.10.3.1.5.2, though generally the impacts are limited to beneficial impacts associated with designation of NLCS lands, ACECs, and NSHT Management Corridors.

IV.10.3.3.6 CEQA Significance Determination for Alternative 1

PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources. Land disturbance associated with site characterization, construction, and decommissioning activities under Alternative 1, instead of continuing current trends and recent patterns of renewable development associated with existing and planned projects, would concentrate development into DFAs that are geographically confined. The paleontology CMA and certain Plan-wide biological CMAs (AM-PW3, AM-PW-5, AM-PW-9, AM-PW-10, and AM-PW-14) partially address the impact mechanisms identified. However, the paleontology CMA is not specific enough nor does it appear to be applicable Plan-wide (i.e., on nonfederal lands). For this reason, potential impacts to paleontological resources from renewable energy development on nonfederal lands could be potentially significant without additional mitigation. However, implementation of Mitigation Measure PR-1a, as described in the Preferred Alternative (see Section IV.10.3.2.1.1),

would ensure a consistent approach to assessment and mitigation and that the fossil-yield potential of the surface and subsurface is fully understood prior to construction. Potential adverse impacts would be less than significant with implementation of Mitigation Measure PR-1a.

PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context. Actions to avoid or minimize impacts on hydrology and erosion that are integrated into the DRECP, as discussed in Chapter IV.5, would likewise reduce the potential for impacts to paleontological resources to a less than significant level (e.g., AM-PW-9 and AM-PW-10). No mitigation is required.

PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism. The discussion and conclusions regarding this potential impact are the same as under the Preferred Alternative (see Section 10.3.2.6, CEQA Significance Determination for the Preferred Alternative), which concludes that the impact is considered *less than significant*. No mitigation is required.

IV.10.3.3.7 Comparison of Alternative 1 with Preferred Alternative

Chapter IV.27 presents a comparison of all action alternatives and the No Action Alternative across all disciplines. This section summarizes the comparison of Alternative 1 with the Preferred Alternative.

IV.10.3.3.7.1 Alternative 1 Compared with Preferred Alternative for Plan-wide DRECP

As the same renewable energy generation goals would be met under both Alternative 1 and the Preferred Alternative, and only the geographic location of the development would change, the potential for impacts would increase or decrease only in terms of the geologic units affected (and their associated PFYCs). In addition, certain DFAs under Alternative 1 are in areas or geologic units already known to be fossil-producing but to a notably lesser degree than those under the Preferred Alternative.

Although the exact location of development would not be known until individual projects are proposed, the footprint impacts of Alternative 1 are less likely to be within geologic units with an HVH PFYC (about 8,000 acres) compared with the Preferred Alternative (about 14,000 acres). As shown in Exhibit IV.10-1, the extent of footprint impacts would also be slightly less overall under Alternative 1 compared with the Preferred Alternative. Furthermore, Alternative 1 concentrates development to a greater extent on private agricultural lands (about 41% of the DFAs), which decreases the potential for impacts to paleontological resources, at least within shallow soils (i.e., a few feet below the ground surface). The Pre-

ferred Alternative includes comparably fewer (one-third the amount of) DFAs that are within agricultural land.

In addition, the DFAs of Alternative 1 would not intersect several known fossil-bearing geologic units that would be impacted under the Preferred Alternative. These include (1) the Horned Toad Formation and the Bopesta Formation (West Mojave and Eastern Slope ecoregion subarea), (2) vertebrate fossil-bearing strata of the Barstow Formation (Mojave and Silurian Valley ecoregion subarea), and (3) known fossil-bearing Paleozoic and Mesozoic sedimentary rocks such as the Sultan Limestone, Bird Spring Formation, and Aztec Sandstone (Kingston and Funeral Mountains ecoregion subarea). The avoidance of such areas can be attributed at least partially to the focus of Alternative 1 on private lands and on geographically confined DFAs.

Though the overarching analyses and conclusions under both alternatives with respect to paleontological resource impacts are the same, there would be notably less potential to impact paleontological resources under Alternative 1 as compared with the Preferred Alternative.

IV.10.3.3.7.2 Alternative 1 Compared with Preferred Alternative for the BLM LUPA

As shown in Exhibit IV.10-2, estimated footprint impacts under Alternative 1 would be about two-thirds of those under the Preferred Alternative. In addition, Alternative 1 would include slightly less area underlain by geologic units with an HVH PFYC (in both absolute and relative terms). On the other hand, BLM LUPA Conservation Designation lands under Alternative 1 would place less emphasis on NLCS lands and a greater emphasis on ACECs and wildlife allocations than would the Preferred Alternative. This may result in slightly fewer beneficial impacts compared with the Preferred Alternative since areas of national-level resource values would receive the strongest protection. However, this distinction results in a relatively minor difference in terms of paleontological resource impacts, since ACECs and wildlife allocations are also protective of paleontological resources.

Though the overarching analyses and conclusions under both alternatives with respect to paleontological resource impacts are the same, there would be slightly less potential to impact paleontological resources on LUPA lands under the Preferred Alternative.

IV.10.3.3.7.3 Alternative 1 Compared with Preferred Alternative for NCCP

The impacts of the NCCP for Alternative 1 are the same as those defined in Section IV.10.3.2.1 for the Plan-wide analysis. As a result, the comparison of Alternative 1 with the Preferred Alternative for the NCCP is the same as described for the Plan-wide DRECP.

IV.10.3.3.7.4 Alternative 1 Compared with Preferred Alternative for the GCP

Alternative 1 would allow renewable energy development on approximately 972,000 acres of DFAs on nonfederal lands as compared with the approximately 1.6 million acres of DFAs on nonfederal lands under the Preferred Alternative. Under Alternative 1, the Reserve Design Lands would include approximately 2.9 million acres on nonfederal lands, compared with the Preferred Alternative that includes approximately 2.7 million acres. Although the GCP under Alternative 1 includes much fewer areas dedicated to DFAs, the ultimate extent of footprint impacts under both alternatives is similar (although Alternative 1 has slightly fewer footprint impacts). Because Alternative 1 would include about 200,000 more acres of Reserve Design Lands, the beneficial effect on paleontological resources in the context of the CGP would be greater than under the Preferred Alternative.

IV.10.3.3.7.5 Geographic Distinctions

The paleontological potential of specific geographic areas under Alternative 1—compared with the Preferred Alternative—would differ only to the extent the paleontological potential of the geologic units underlying developable areas differ. Specific geographic areas of potential interest to managing agencies include:

- The Silurian Valley (Mojave and Silurian Valley ecoregion subarea).
- The Pahrump Valley area (Kingston and Funeral Mountains ecoregion subarea).
- The area north of Tehachapi (West Mojave and Eastern Slopes ecoregion subarea).
- The area east of Twentynine Palms (Providence and Bullion Mountains ecoregion subarea).
- Owens Lake (Owens River Valley ecoregion subarea).
- Searles Lake between Fort Irwin and China Lake (Panamint Death Valley ecoregion subarea).
- The area along U.S. Route 395 north of Edwards Air Force Base (West Mojave and Eastern Slopes ecoregion subarea).

Differences in the distribution of PFYCs are shown across each geographic ecoregion in Appendix R2.10. These differences are generally minor, as shown by comparing Tables R2.10-3 and R2.10-4 (Preferred Alternative) with Tables R2.10-6 and R2.10-7 (Alternative 1).

More localized differences between Alternative 1 and the Preferred Alternative in the geographic areas listed above may exist, but the type and nature of impacts to paleontological resources would be the same. This is because fossil-yielding geologic units could be

encountered under either alternative, and because any ground disturbance—even if confined to areas mapped as having an LVL PFYC—could result in significant impacts on fossils or fossil-bearing formations (e.g., in the subsurface). For example, the DFAs of Alternative 1 would not intersect several known fossil-bearing geologic units that would be impacted under the Preferred Alternative including (1) the Horned Toad Formation and the Bopesta Formation (West Mojave and Eastern Slope ecoregion subarea), (2) vertebrate fossil-bearing strata of the Barstow Formation (Mojave and Silurian Valley ecoregion subarea), and (3) known fossil-bearing Paleozoic and Mesozoic sedimentary rocks such as the Sultan Limestone, Bird Spring Formation, and Aztec Sandstone (Kingston and Funeral Mountains ecoregion subarea). However, under both alternatives, the impact conclusion and impact reduction strategies are the same.

While the underlying potential to impact fossil-yielding geologic units may differ between Alternative 1 and the Preferred Alternative in specific geographic regions, the impact conclusion under CEQA and NEPA, as well as the impact reduction strategies and mitigation measures, would be the same.

IV.10.3.4 Alternative 2

The impact analysis for paleontological resources under Alternative 2 is provided in the following sections.

IV.10.3.4.1 Plan-wide Impacts of Implementing the DRECP: Alternative 2

This section provides the Plan-wide assessment of impacts from implementing the DRECP for Alternative 2. This Plan-wide assessment addresses the impacts and mitigation measures from renewable energy and transmission development and impacts of the reserve design.

IV.10.3.4.1.1 Plan-wide Impacts and Mitigation Measures From Renewable Energy and Transmission Development

Impact Assessment

The following sections provide the Plan-wide assessment of impacts and mitigation measures for renewable energy and transmission development for Alternative 2. Alternative 2 includes DFAs (2,475,000 acres) and transmission corridors where approximately 164,000 acres of ground disturbance–related impacts and operations impacts would occur. Alternative 2 includes FAAs, and these areas are not considered impacted or conserved in this analysis. Alternative 2 includes geographically dispersed DFAs with focus on public and private lands with expanded opportunities for wind energy development. Wind and solar energy DFAs are more dispersed across the Plan Area, and geothermal is emphasized in the Imperial Borrego Valley ecoregion subarea. The reserve design under Alternative 2 includes

less protection of Fremont Valley, Ridgecrest, Silurian Valley, and the area south of Chocolate Mountains than the alternative-specific reserve design for the Preferred Alternative.

Impact PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources.

The nature and intensity of paleontological resource impacts from renewable energy and transmission development under Alternative 2 would be the same as described in Section IV.10.2; but the location and extent of impacts would differ from the Preferred Alternative, Alternative 1, and Alternatives 3 and 4. Table R2.10-8 presents the estimated Plan-wide paleontological resource impacts by ecoregion subarea based on the general distribution of geologic formations (and their PFYCs) within DFAs, as well as the estimates of permanent disturbance presented in Volume II, Chapter II.3. The estimated footprint impacts shown in Table R2.10-8 do not include the disturbance that could occur as a result of renewable energy transmission outside of the DFAs. However, the potential transmission corridors—while not located precisely—can roughly be expected to be underlain by geologic units with a PFYC distribution similar to that within the conceptual energy corridors. The distribution of PFYCs within conceptual energy corridors is 5%, 82%, and 9% for LVL, MU, and HVH, respectively. (The remainder is mapped as water.)

Plan-wide, approximately 16% of the DFAs of Alternative 2 are underlain by geologic units with an HVH PFYC, 76% of the DFAs are underlain by geologic units with an MU PFYC, and approximately 6% of the DFAs are underlain by geologic units with an LVL PFYC. (The remaining 2% consists of water bodies.) The greatest degree of footprint impacts overall would be within the Imperial Borrego Valley ecoregion subarea, where 53,000 acres could experience ground disturbances, 12% of which (6,000 acres) could occur within areas with an HVH PFYC. The greatest potential impacts on geologic units with HVH PFYCs, however, would be within the West Mojave and Eastern Slopes ecoregion subarea. In this ecoregion subarea, 22% of the estimated footprint impacts (9,000 acres) could be underlain by geologic units with HVH PFYCs. DFAs within the Cadiz Valley and Chocolate Mountains ecoregion subarea could experience about 20,000 acres of footprint impact, 21% of which could potentially be underlain by geologic units with HVH PFYCs.

Some of the DFAs are in areas known as vertebrate fossil-yielding geologic units. In the eastern San Felipe Hills (Imperial Borrego Valley ecoregion subarea) fossil-bearing strata of the Palm Spring Group and Brawley Formation occur in areas where DFAs associated with all action alternatives are sited. In the Palo Verde Valley area and adjacent Palo Verde Mesa (Cadiz Valley and Chocolate Mountains ecoregion subarea), DFAs associated with the all five action alternatives are sited in areas underlain by known vertebrate fossil-bearing Pleistocene paleosols. Alternative 2 has DFAs that could also overlap with (1) fossil-bearing strata of the Horned Toad Formation and the Bopesta Formation (West Mojave and Eastern

Slope ecoregion subarea), and (2) vertebrate fossil-bearing strata of the Barstow Formation (Mojave and Silurian Valley ecoregion subarea). As indicated in Table R2.10-8, many other areas may be underlain by fossil-yielding geologic units, but these provide examples specific to Alternative 2.

This distribution of PFYCs within the DFAs indicate that in almost all circumstances—whether or not known paleontological resources are present—subsurface excavations associated with all technologies may impact geologic units that are potentially fossil-yielding. As shown in Table R2.10-8, the vast majority of the footprint impacts within the DFAs (94%) would be in areas underlain by geologic units with an MU or HVH PFYC. On the other hand, about 27% of the DFAs within Alternative 2 would be sited on agricultural land. In these areas, the potential for adverse impacts on paleontological resources is limited to deeper soils; surface disturbances and light grading would generally have a very low probability of affecting significant paleontological resources.

Renewable energy development in all cases could adversely impact paleontological resources as discussed in Section IV.10.2. However, the conservation strategy emphasis on compensation in Alternative 2 and the more dispersed distribution that does not emphasize private (agricultural) lands mean that there is a similar potential for impacts compared with the Preferred Alternative.

Impact PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context.

The typical effects with respect to erosion and soil loss are described in greater detail in Section IV.10.2, though the location and extent of impacts for Alternative 2 would differ somewhat from the Preferred Alternative and Alternatives 1, 3, and 4. The potential for this type of impact to occur within the Plan Area would be proportional to the severity of hydrologic impacts discussed in Chapter IV.5. The analysis presented therein indicates all renewable energy technologies could have adverse effects on the rate of erosion, soil loss, or drainage patterns but that solar energy development would have the greatest potential for adverse impacts. Therefore, indirect impacts to paleontological resources may be greater in areas emphasizing solar development, such as the Imperial Borrego Valley, the Pinto Lucerne Valley and Eastern Slopes, and the West Mojave and Eastern Slopes ecoregion subareas.

Substantial adverse impacts can be avoided or sufficiently minimized by compliance with applicable laws, ordinances, regulations, and standards. These include implementation of stormwater pollution prevention plan design criteria, monitoring water quality and wastewater management, and Clean Water Act and related state and local agency compliance. To

the extent these actions reduce impacts on hydrology, drainage, and erosion (see Chapter IV.5), they would also reduce impacts on paleontological resources.

Impact PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism.

The nature and intensity of paleontological resource impacts from renewable energy and transmission development under Alternative 2 would be the same as described in Section IV.10.2, but the location and extent of impacts would differ somewhat from the Preferred Alternative and Alternatives 1, 3, and 4. Typically, renewable energy transmission and development that is further removed from existing roads and transmission infrastructure would have a greater potential to increase unauthorized collection or vandalism. Potential transmission corridors conceptually identified under Alternative 2 are similar to the Preferred Alternative. This means that public accessibility to currently inaccessible areas would not change greatly. Otherwise, the impacts described under the No Action Alternative (see Section IV.10.3.1) would be the same as the unauthorized-collection or vandalism impacts of Alternative 2.

Impacts in Study Area Lands

Future Assessment Areas. Lands within FAAs are neither reserve lands nor DFAs; they are simply areas that are deferred for future assessment. The future assessment will determine their suitability for renewable energy development or ecological conservation. If renewable energy development occurs on FAA lands, a Land Use Plan Amendment would not be required. FAAs for each alternative are included and located as shown in Table IV.1-2 and Figure II.5-1 in Volume II. The FAAs represent areas where renewable energy development or inclusion to the reserve design could be implemented through an amendment to the DRECP, but additional assessment would be needed.

Because most of the FAAs are presented as "undesignated areas" in the action alternatives, there would be no difference between the FAAs in the Preferred Alternative except that renewable development in an FAA would not require a BLM Land Use Plan Amendment so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the FAAs would impact paleontological resources in the same manner as discussed for the DFAs, with the potential for impacts increasing in areas assigned to higher PFYCs and where FAAs occupy a greater geographic extent. FAAs under Alternative 2 are in the Pinto Lucerne Valley and Eastern Slopes, Providence and Bullion Mountains, West Mojave and Eastern Slopes ecoregion subareas. Together, they are underlain by geologic units with the following PFYC distribution: 11% LVL, 45% MU, and 44% HVH. This is a distribution that is highly skewed toward areas that are paleontologically sensitive when compared to the general distributions of PFYCs in the Plan Area.

Special Analysis Areas. Designating the SAAs as development would result in impacts similar to those identified for the DFAs for the Plan-wide impacts.

DRECP Variance Lands. DRECP Variance Lands represent the BLM Solar PEIS Variance Lands as screened for the DRECP and EIR/EIS based on BLM screening criteria. Covered Activities could be permitted for NCCP purposes only through an NCCP plan amendment. However, development of renewable energy on variance lands would not require a BLM LUPA; so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the DRECP Variance Lands would impact paleontological resources in the same manner as discussed for the DFAs, with the potential for impacts increasing in areas assigned to higher PFYCs.

Impact Reduction Strategies and Mitigation

Plan implementation would result in conservation of some desert lands as well as the development of renewable energy generation and transmission facilities on other lands. There are several ways in which the impacts of the renewable energy development covered by the Plan would be lessened. First, the Plan incorporates CMAs for each alternative, including specific biological reserve design components and LUPA components. Also, the implementation of existing laws, orders, regulations, and standards would reduce the impacts of project development. If significant impacts would still result after implementation of CMAs and compliance with applicable laws and regulations, then specific mitigation measures are recommended in this section.

Conservation and Management Actions

The conservation strategy for Alternative 2 (presented in Volume II, Section II.3.1.1) defines specific actions that would reduce the impacts of this alternative. The conservation strategy includes definition of the reserve design and specific CMAs for the Preferred Alternative. While the CMAs were developed for BLM lands only, this analysis assumes that all CMAs would be applied also to nonfederal lands.

The CMAs applicable to paleontological resources listed under the Preferred Alternative—which includes (1) the paleontology CMA, (2) worker education, (3) standard practices for siting and design, (4) standard practices for hydrology and water resources, (5) standard practices for soil resources, and (6) certain landscape-level biological CMAs—would likewise apply to this alternative.

Laws and Regulations

Similar to the No Action Alternative, existing laws and regulations will reduce certain impacts of Plan implementation. Relevant regulations are presented in the Regulatory

Setting in Volume III. The requirements of relevant laws and regulations are summarized for the No Action Alternative in Section IV.10.3.1.1.1. There are no other laws or regulations that would uniquely apply to this alternative.

Mitigation Measures

After implementation of the CMAs and existing laws and regulations, mitigation measures will be applied to further reduce some of the DRECP's adverse impacts. The paleontology CMA and certain Plan-wide biological CMAs (AM-PW3, AM-PW-5, AM-PW-9, AM-PW-10, and AM-PW-14) partially address the potential adverse effects identified. However, as under the Preferred Alternative, the paleontology CMA is not specific enough and does not clearly apply to nonfederal land. Implementation of Mitigation Measure PR-1a, as described in the Preferred Alternative (see Section IV.10.3.2.1.1), would ensure a consistent approach to assessment and mitigation and that the fossil-yield potential of the surface and subsurface is fully understood prior to construction.

IV.10.3.4.1.2 Impacts from Reserve Design

The impacts of the reserve design collectively refer to the designation and management of existing conservation areas (i.e., Legislatively and Legally Protected Areas and Military Expansion Mitigation Lands), BLM LUPA Conservation Designations, and reserves established within Conservation Planning Areas. Overall of the 15,259,000 acres within the Alternative 2 Reserve Design Lands, 41% are within BLM LUPA Conservation Designations, 8% in the Conservation Planning Areas, and the remaining 51% in existing conservation areas. Of the BLM LUPA Conservation Designations under Alternative 2, 82% would be NLCS lands, 18% would be ACECs, and 0% would be wildlife allocations.

To the extent that such areas are newly established or expanded (i.e., beyond existing protected areas), the reserve design would be considered a beneficial impact on paleontological resources because renewable energy development would be precluded in these areas and because efforts to preserve wildlife, habitat, and ecologic values would likewise serve to protect paleontological resources. The Plan-wide distribution of PFYCs is 28%, 53%, and 18% for LVL, MU, and HVH, respectively. This generalized distribution of PFYCs within the reserve design indicate that in almost all circumstances—whether or not known paleontological resources are present—new or expanded reserve design elements would also serve to protect geologic units that are potentially fossil-yielding.

IV.10.3.4.2 Impacts of DRECP LUPA on BLM Land: Alternative 2

This section addresses two components of effects of the BLM LUPA: the streamlined development of renewable energy and transmission on BLM land under the LUPA and the impacts of the amended land use plans themselves.

IV.10.3.4.2.1 Impacts from Renewable Energy and Transmission Development on BLM Land

On BLM lands under the LUPA, Alternative 2 includes DFAs (720,000 acres) and transmission corridors where approximately 61,000 acres of ground disturbance–related impacts and operations impacts would occur.

Impact PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in Alternative 2 would be the same as described in the analysis of Plan-wide impacts, but the location and extent of impacts would be restricted to BLM-administered land only. In addition, when potential footprint impacts of the DFAs are examined in the context of BLM-administered land only, a relatively minor fraction of the affected area is underlain by agricultural land uses, which (at least within near-surface soils) normally minimize the potential for adverse impacts to paleontological resources, even in areas that are underlain by fossil-yielding geologic units. Under the DRECP LUPA, renewable energy development on BLM lands in DFAs would be streamlined (i.e., permitted faster and with fewer steps). However, the speed or timing of renewable energy development ultimately does not affect the magnitude of potential paleontological impacts.

Table R2.10-9 presents the estimated BLM LUPA paleontological resource impacts by ecoregion subarea. The estimated footprint impacts shown in Table R2.10-9 do not include the disturbance that could occur as a result of renewable energy transmission outside of the DFAs. However, the potential transmission corridors—while not located precisely—can roughly be expected to be underlain by geologic units with a PFYC distribution similar to that within the conceptual energy corridors. The distribution of PFYCs within conceptual energy corridors is 9%, 64%, and 27% for LVL, MU, and HVH, respectively. With respect to DFAs, the Imperial Borrego Valley ecoregion subarea would experience the greatest impacts, with an estimated 16,000 acres of potential land disturbance, 36% (6,000 acres) of which is within an HVH PFYC. The DFAs in Alternative 2 include a large new area near (but not within) the Algodones Sand Dunes, which has high paleontological sensitivity. This accounts for the relative increase in the amount of land underlain by HVH PFYCs compared with all other action alternatives. The Cadiz Valley and Chocolate Mountains ecoregion subarea would experience the next highest level of footprint impact, with 14,425 acres of potential footprint impacts within DFAs, 26% of which (4,000 acres) are within an HVH PFYC.

The expanded wind opportunities and the large fraction of the DFAs within federal land mean that potential impacts are comparable to the No Action Alternative and potentially greater than the Preferred Alternative.

Impact PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in Alternative 2 would be the same as described in the analysis of Plan-wide impacts (see Section IV.10.3.2.1.1), but the location and extent of impacts would be restricted to BLM-administered land only. The mix of renewable energy technology on BLM-administered land under Alternative 2 would be focused more on expanded wind energy opportunities, with the types of impacts being as described in the Plan-wide analysis (see Section IV.10.3.2.1.1) and the discussion of impacts typical to all alternatives (see Section IV.10.2.1).

Impact PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in Alternative 2 would be the same as described in the analysis of Plan-wide impacts (see Section IV.10.3.2.1.1), but the location and extent of impacts would be restricted to BLM-administered land only. The mix of renewable energy technology on BLM-administered land under Alternative 2 would be focused more on expanded wind energy opportunities, with the types of impacts being as described in the Plan-wide analysis (see Section IV.10.3.2.1.1) and the discussion of impacts typical to all alternatives (see Section IV.10.2.1).

IV.10.3.4.2.2 Impacts of Changes to BLM Land Designations

The BLM LUPA would establish Conservation Designations on BLM-administered lands under each alternative that would conserve biological resource resources (and thus incidentally paleontological resources), including NLCS lands, ACECs, and wildlife allocations. On BLM-administered lands under Alternative 2, the BLM LUPA would designate approximately 5,238,000 acres of BLM LUPA Conservation Designations: 5,158,000 acres of NLCS lands, 79,000 acres of ACECs, and 700 acres of wildlife allocations. BLM land designations under LUPA emphasize designation of NLCS lands and include more identification of lands with national-level resource values than under the Preferred Alternative.

To the extent that Conservation Designations are newly established or expanded (i.e., beyond existing protected areas), such BLM land designations would be considered a beneficial impact on paleontological resources because renewable energy development would be precluded in these areas and because efforts to preserve wildlife, habitat, and ecologic values would likewise serve to protect paleontological resources. The Plan-wide distribu-

tion of PFYCs is 28%, 53%, and 18% for LVL, MU, and HVH, respectively. This distribution of PFYCs Plan-wide indicate that in almost all circumstances—whether or not known paleontological resources are present—new or expanded reserve design elements would serve to protect geologic units that are potentially fossil-yielding.

Under Alternative 2, the following scientific values associated with paleontological and geologic resources would be added or increased within NLCS lands (but would not be included under the Preferred Alternative):

- Paleontological values associated with the Coyote Mountains would be added in Alternative 2. The Coyote Mountains are a nationally significant fossil site where a 50-million-year record of geologic history is exposed, particularly the fossil-bearing Imperial Formation. This small mountain range has been famous for paleontological collecting and research since the nineteenth century. Fossils are predominantly marine invertebrates such as coral, mollusks, and gastropods; however vertebrate species are also represented by shark teeth and portions of a whale. The visibility of these resources, coupled with dramatic geology and spectacular scenic landforms, have made this area famous for paleontologists, students, photographers, and other visitors.
- Areas of paleontological values included in National Conservation Lands would increase in Rainbow Basin and slightly increase in the Manix area.

However, the paleontological resources within these areas would continue to be protected in accordance with current policy, and there would be no DFAs proposed in these areas.

Expansion or designation of new ACECs, SRMAs, and NSHT Management Corridors, to the extent that they allow an increase in public accessibility or new/expanded open OHV areas, could result in adverse impacts to paleontological resources at the ground surface (no subsurface impacts). These would have the same effects as described under the No Action Alternative. Only the location and extent of SRMAs would change. Unit-specific SRMA worksheets are in Appendix L, and the CMAs specific to lands managed to protect wilderness characteristics are provided as part of the Volume II descriptions of the DRECP alternatives.

IV.10.3.4.3 Impacts of Natural Community Conservation Plan: Alternative 2

The impacts of the NCCP for Alternative 2 would be the same as those defined in Section IV.10.3.2.1 for the Plan-wide analysis.

IV.10.3.4.4 Impacts of General Conservation Plan

The impacts of the GCP for Alternative 2 would be similar to those defined in Section IV.10.3.2.1 for the Plan-wide analysis, but they would occur on nonfederal lands only. On nonfederal lands under the GCP, Alternative 2 includes DFAs (1,730,000 acres) and transmission corridors where approximately 106,000 acres of ground disturbance–related impacts and operations impacts would occur.

IV.10.3.4.5 Impacts Outside of Plan Area

IV.10.3.4.5.1 Impacts of Transmission Outside of Plan Area

The impacts of Outside of Plan Area transmission on paleontological resources would be the same under all alternatives. These impacts are as described for the No Action Alternative in Section IV.10.3.1.5.1.

IV.10.3.4.5.2 Impacts of BLM LUPA Decisions Outside of Plan Area

Under the proposed BLM LUPA, the only changes outside the Plan Area would be the designation of NLCS lands, ACECs, and NSHT Management Corridors, and Visual Resource Management Classes and new land allocations to replace multiple-use classes on CDCA lands. The nature and intensity of impacts on paleontological resources would be the same as those described in Section IV.10.3.1.5.2; though generally the impacts are limited to beneficial impacts associated with designation of NLCS lands, ACECs, and NSHT Management Corridors.

IV.10.3.4.6 CEQA Significance Determination for Alternative 2

PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources. Land disturbance associated with site characterization, construction, and decommissioning activities under Alternative 2, instead of continuing current trends and recent patterns of renewable development associated with existing and planned projects, would concentrate development into DFAs that are geographically dispersed. The paleontology CMA and certain Plan-wide biological CMAs (AM-PW3, AM-PW-5, AM-PW-9, AM-PW-10, and AM-PW-14) partially address the impact mechanisms identified. However, the paleontology CMA is not specific enough nor does it appear to be applicable Plan-wide (i.e., on nonfederal lands). For this reason, potential impacts to paleontological resources from renewable energy development on nonfederal lands could be significant without additional mitigation. However, implementation of Mitigation Measure PR-1a, as described in the Preferred Alternative (see Section IV.10.3.2.1.1) would ensure a consistent approach to assessment and mitigation and that the fossil-yield potential of the surface and subsurface is fully understood prior to construction. Potential adverse impacts would be less than significant with implementation of Mitigation Measure PR-1a.

PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context. Actions to avoid or minimize impacts on hydrology and erosion that are integrated into the DRECP, as discussed in Chapter IV.5, would likewise reduce the potential for impacts to paleontological resources to a less than significant level (e.g., AM-PW-9 and AM-PW-10). No mitigation is required.

PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism. The discussion and conclusions regarding this potential impact is the same as under the Preferred Alternative (see Section 10.3.2.6), which concludes that the impact is considered less than significant. No mitigation is required.

IV.10.3.4.7 Comparison of Alternative 2 with Preferred Alternative

Chapter IV.27 presents a comparison of all action alternatives and the No Action Alternative across all disciplines. This section summarizes the comparison of Alternative 2 with the Preferred Alternative.

IV.10.3.4.7.1 Alternative 2 Compared with Preferred Alternative for Plan-wide DRECP

As the same renewable energy generation goals would be met under both Alternative 2 and the Preferred Alternative, and only the geographic location of the development would change, the potential for impacts would increase or decrease only in terms of the geologic units affected (and their associated PFYCs). In addition, certain DFAs under Alternative 2 are in areas or geologic units already known to be fossil-producing but to a slightly lesser degree than those under the Preferred Alternative.

Although the exact location of development would not be known until individual projects are proposed, the footprint impacts of Alternative 2 are more likely to be within geologic units with an HVH PFYC (about 21,000 acres) compared with the Preferred Alternative (about 14,000 acres). As shown in Exhibit IV.10-1, the extent of footprint impacts would also be somewhat less overall under Alternative 2 compared with the Preferred Alternative. Alternative 2 has a similar dispersed pattern of DFAs and a similar (though slightly less) extent of DFAs within private agricultural lands (about a 27% of the DFAs) as compared with the Preferred Alternative.

In addition, the DFAs of Alternative 2 would similarly overlap with several known fossil-bearing geologic units that would also be impacted under the Preferred Alternative. The one exception is that the DFAs in Alternative 2 would not overlap with the known fossil-bearing Paleozoic and Mesozoic sedimentary rocks (such as the Sultan Limestone, Bird Spring Formation, and Aztec Sandstone) within the Kingston and Funeral Mountains eco-

region subarea. The avoidance of such areas can be attributed at least partially to the focus of Alternative 2 on private lands and on geographically confined DFAs.

Though the overarching analyses and conclusions under both alternatives with respect to paleontological resource impacts are the same, there would be a similar to slightly greater potential to impact paleontological resources under Alternative 2 as compared with the Preferred Alternative.

IV.10.3.4.7.2 Alternative 2 Compared with Preferred Alternative for the BLM LUPA

As shown in Exhibit IV.10-2, estimated footprint impacts under Alternative 2 would be almost twice those under the Preferred Alternative. In addition, Alternative 2 would have well more than twice the amount of DFAs underlain by geologic units with an HVH PFYC. On the other hand, BLM LUPA Conservation Designation lands under Alternative 2 would place a greater emphasis on NLCS lands and a lesser emphasis on ACECs and wildlife allocations than would the Preferred Alternative. This may result in slightly greater beneficial impacts compared with the Preferred Alternative since areas of national-level resource values would receive the strongest protection. However, this distinction results in a relatively minor difference in paleontological resource impacts, since ACECs and wildlife allocations are also protective of paleontological resources.

Though the overarching analyses and conclusions under both alternatives with respect to paleontological resource impacts are the same, there would be a greater potential to impact paleontological resources under Alternative 2 because the geographic placement of DFAs is less favorable from a paleontological resources perspective.

IV.10.3.4.7.3 Alternative 2 Compared with Preferred Alternative for NCCP

The impacts of the NCCP for Alternative 2 are the same as those defined in Section IV.10.3.2.1 for the Plan-wide analysis. As a result, the comparison of Alternative 2 with the Preferred Alternative for the NCCP is the same as described for the Plan-wide DRECP.

IV.10.3.4.7.4 Alternative 2 Compared with Preferred Alternative for the GCP

Alternative 2 would allow renewable energy development on approximately 1.7 million acres of DFAs on nonfederal lands as compared with the approximately 1.6 million acres of DFAs on nonfederal lands under the Preferred Alternative. Under Alternative 2, the Reserve Design Lands would include approximately 2.6 million acres on nonfederal lands, compared with the Preferred Alternative, which includes approximately 2.7 million acres. Because the GCP under Alternative 2 includes a similar amount of DFAs and Reserve Design Lands compared with the Preferred Alternative, effects on paleontological resources would be similar.

IV.10.3.4.7.5 Geographic Distinctions

The paleontological potential of specific geographic areas under Alternative 2—compared with the Preferred Alternative—would differ only to the extent the paleontological potential of the geologic units underlying developable areas differ. Specific geographic areas of potential interest to managing agencies include:

- The Silurian Valley (Mojave and Silurian Valley ecoregion subarea).
- The Pahrump Valley (Kingston and Funeral Mountains ecoregion subarea).
- The area north of Tehachapi (West Mojave and Eastern Slopes ecoregion subarea).
- The area east of Twentynine Palms (Providence and Bullion Mountains ecoregion subarea).
- Owens Lake (Owens River Valley ecoregion subarea).
- Searles Lake between Fort Irwin and China Lake (Panamint Death Valley ecoregion subarea).
- The area along U.S. Route 395 north of Edwards Air Force Base (West Mojave and Eastern Slopes ecoregion subarea).

Differences in the distribution of PFYCs are shown across each geographic ecoregion subarea in Appendix R2.10. These differences are generally minor, as shown by comparing Tables R2.10-3 and R2.10-4 (Preferred Alternative) with Tables R2.10-8 and R2.10-9 (Alternative 2).

More localized differences between Alternative 2 and the Preferred Alternative in the geographic areas listed may exist, but the type and nature of impacts to paleontological resources would be the same. This is because fossil-yielding geologic units could be encountered under either alternative, and because any ground disturbance—even if confined to areas mapped as having an LVL PFYC—could result in significant impacts on fossils or fossil-bearing formations (e.g., in the subsurface). For example, the DFAs in Alternative 2 would not overlap with the known fossil-bearing Paleozoic and Mesozoic sedimentary rocks (such as the Sultan Limestone, Bird Spring Formation, and Aztec Sandstone) within the Kingston and Funeral Mountains ecoregion subarea. However, under both alternatives, the impact conclusion and impact reduction strategies are the same.

While the underlying potential to impact fossil-yielding geologic units may differ between Alternative 2 and the Preferred Alternative in specific geographic regions, the impact conclusion under CEQA and NEPA, as well as the impact reduction strategies and mitigation measures, would be the same.

IV.10.3.5 Alternative 3

The impact analysis for paleontological resources under Alternative 3 is provided in the following sections.

IV.10.3.5.1 Plan-wide Impacts of Implementing the DRECP: Alternative 3

This section provides the Plan-wide assessment of impacts of implementing the DRECP for Alternative 3. This Plan-wide assessment addresses the impacts and mitigation measures from renewable energy and transmission development and impacts of the reserve design.

IV.10.3.5.1.1 Plan-wide Impacts and Mitigation Measures From Renewable Energy and Transmission Development

Impact Assessment

The following provides the Plan-wide assessment of impacts and mitigation measures for renewable energy and transmission development for Alternative 3. Alternative 3 includes DFAs (1,408,000 acres) and transmission corridors where approximately 177,000 acres of ground disturbance–related impacts and operations impacts would occur. Alternative 3 includes FAAs, and these areas are not considered impacted or conserved in this analysis. Alternative 3 includes geographically dispersed DFAs on public and private lands with Plan-wide emphasis on solar technologies as well as geothermal. DFAs emphasizing solar are in the Imperial Borrego Valley and the West Mojave and Eastern Slopes ecoregion subareas, and DFAs emphasizing geothermal are in the Imperial Borrego Valley and the Owens River Valley ecoregion subareas. DFAs emphasizing wind are in the Pinto Lucerne Valley and Eastern Slopes and the West Mojave and Eastern Slopes ecoregion subareas.

Impact PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources.

The nature and intensity of paleontological resource impacts from renewable energy and transmission development under Alternative 3 would be the same as described in Section IV.10.2, but the location and extent of impacts would differ somewhat from the Preferred Alternative and Alternatives 1, 2, and 4. Table R2.10-10 presents the estimated Plan-wide paleontological resource impacts by ecoregion subarea based on the general distribution of geologic formations (and their PFYCs) within DFAs, as well as the estimates of permanent disturbance presented in Volume II, Chapter II.3. The estimated footprint impacts shown in Table R2.10-10 do not include the disturbance that could occur as a result of renewable energy transmission outside of the DFAs. However, the potential transmission corridors—while not located precisely—can roughly be expected to be underlain by geologic units with a PFYC distribution similar to that within the conceptual

energy corridors. The distribution of PFYCs within conceptual energy corridors is 2%, 85%, and 7% for LVL, MU, and HVH, respectively.

Plan-wide, approximately 7% of the DFAs of Alternative 3 are underlain by geologic units with an HVH PFYC, 87% of the DFAs are underlain by geologic units with an MU PFYC, and approximately 3% of the DFAs are underlain by geologic units with an LVL PFYC. (The remaining 3% consists of water bodies.) The greatest degree of footprint impacts would be within the Imperial Borrego Valley ecoregion subarea, where 62,000 acres could experience ground disturbances, 4% of which (3,000 acres) could occur within areas with an HVH PFYC. This potential to impact geologic units with an HVH PFYC is relatively low compared with potential impacts in other ecoregion subareas, such as the Cadiz Valley and Chocolate Mountains ecoregion subarea, where 17% of the ecoregion subarea (4,000 acres) is underlain by geologic units with an HVH PFYC.

Some of the DFAs are in areas known as vertebrate fossil-yielding geologic units. For example, in the area immediately northeast of Barstow and northwest of Daggett (Mojave and Silurian Valley ecoregion subarea), a portion of the DFAs is underlain by vertebrate fossil-bearing strata of the Barstow Formation. In the eastern San Felipe Hills (Imperial Borrego Valley ecoregion subarea) fossil-bearing strata of the Palm Spring Group and Brawley Formation occur in areas where DFAs associated with all action alternatives are sited. In the Palo Verde Valley area and adjacent Palo Verde Mesa (Cadiz Valley and Chocolate Mountains ecoregion subarea), DFAs associated with all five action alternatives are sited in areas underlain by known vertebrate fossil-bearing Pleistocene paleosols. As indicated in Table R2.10-10, many other areas may be underlain by fossil-yielding geologic units; but these provide examples specific to Alternative 3.

This distribution of PFYCs within the DFAs indicate that in almost all circumstances—whether or not known paleontological resources are present—subsurface excavations associated with all technologies may impact geologic units that are potentially fossil-yielding. As shown in Table R2.10-10, the vast majority of the footprint impacts within the DFAs (90%) would be in areas underlain by geologic units with an MU or HVH PFYC. On the other hand, about 32% of the DFAs within Alternative 3 would be sited on agricultural land. In these areas, the potential for adverse impacts on paleontological resources is limited to deeper soils; surface disturbances and light grading would generally have a very low probability of affecting significant paleontological resources.

Renewable energy development in all cases could adversely impact paleontological resources. This alternative generally represents a mix of the previous alternatives, although the emphasis on solar in the Imperial Borrego Valley and the West Mojave and Eastern Slopes ecoregion subareas (and away from the Cadiz and Chocolate Mountains eco-

region subarea) may have helped lessen the area underlain by geologic units with an HVH PFYC compared with the Preferred Alternative.

Impact PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context.

The typical effects with respect to erosion and soil loss are described in greater detail in Section IV.10.2, though the location and extent of impacts for Alternative 3 would differ somewhat from the Preferred Alternative and Alternatives 1, 2, and 4. The potential for this type of impact to occur within the Plan Area would be proportional to the severity of hydrologic impacts discussed in Chapter IV.5. The analysis presented therein indicates all renewable energy technologies could have adverse effects on the rate of erosion, soil loss, or drainage patterns, but solar energy development would have the greatest potential for adverse impacts. Therefore, indirect impacts to paleontological resources may be greater in areas emphasizing solar development, such as the Imperial Borrego Valley and the West Mojave and Eastern Slopes ecoregion subareas as compared with the Pinto Lucerne Valley and Eastern Slopes ecoregion subarea, which emphasizes wind and geothermal, and the Owens River Valley ecoregion subarea, which emphasizes wind and geothermal.

Regardless of the extent and magnitude of potential hydrologic effects, substantial adverse impacts can be avoided or sufficiently minimized by compliance with applicable laws, ordinances, regulations, and standards. These include implementation of stormwater pollution prevention plan design criteria, monitoring water quality and wastewater management, and Clean Water Act and related state and local agency compliance. To the extent these actions reduce impacts on hydrology, drainage, and erosion (see Chapter IV.5), they would also reduce impacts on paleontological resources.

Impact PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism.

The nature and intensity of paleontological resource impacts from renewable energy and transmission development under Alternative 3 would be the same as described in Section IV.10.2, but the location and extent of impacts would differ somewhat from the Preferred Alternative and Alternatives 1, 2, and 4. Potential transmission corridors conceptually identified under Alternative 3 tend to follow existing major roads, highways, and utility corridors; and the DFAs, being more concentrated, may require fewer transmission corridors. This means that public accessibility to currently inaccessible areas would not change greatly. Otherwise, the impacts described under the No Action Alternative (see Section IV.10.3.1) would be the same as the unauthorized-collection or vandalism impacts of Alternative 3.

Impacts in Study Area Lands

Future Assessment Areas. Lands within FAAs are neither reserve lands nor DFAs; they are simply areas that are deferred for future assessment. The future assessment will determine their suitability for renewable energy development or ecological conservation. If renewable energy development occurs on FAA lands, a Land Use Plan Amendment would not be required. FAAs for each alternative are included and located as shown in Table IV.1-2 and Figure II.6-1 in Volume II. The FAAs represent areas where renewable energy development or inclusion to the reserve design could be implemented through an amendment to the DRECP, but additional assessment would be needed.

Because most of the FAAs are presented as "undesignated areas" in the action alternatives, there would be no difference between the FAAs in Alternative 3 except that renewable development in an FAA would not require a BLM Land Use Plan Amendment; so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the FAAs would impact paleontological resources in the same manner as discussed for the DFAs, with the potential for impacts increasing in areas assigned to higher PFYCs. In almost all circumstances—whether or not known paleontological resources are present—subsurface excavations associated with all technologies may impact geologic units that are potentially fossil-yielding. The distribution of PFYCs within FAAs for Alternative 3 is 8% LVL and 92% MU. This distribution is much more favorable compared with the DFAs as none of the FAAs are underlain by geologic units with HVH paleontological sensitivity.

Special Analysis Areas. Designating the SAAs as conservation would have no impact on this resource. Impacts would be the same as those explained for the Plan-wide reserve design.

DRECP Variance Lands. DRECP Variance Lands represent the BLM Solar PEIS Variance Lands as screened for the DRECP and EIR/EIS based on BLM screening criteria. Covered Activities could be permitted for NCCP purposes only through an NCCP plan amendment. However, development of renewable energy on variance lands would not require a BLM LUPA; so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the DRECP Variance Lands would impact paleontological resources in the same manner as discussed for the DFAs, with the potential for impacts increasing in areas assigned to higher PFYCs.

Impact Reduction Strategies and Mitigation

Plan implementation would result in conservation of some desert lands as well as the development of renewable energy generation and transmission facilities on other lands. There are several ways in which the impacts of the renewable energy development covered

by the Plan would be lessened. First, the Plan incorporates CMAs for each alternative, including specific biological reserve design components and LUPA components. Also, the implementation of existing laws, orders, regulations, and standards would reduce the impacts of project development. If significant impacts would still result after implementation of CMAs and compliance with applicable laws and regulations, then specific mitigation measures are recommended in this section.

Conservation and Management Actions

The conservation strategy for Alternative 3 (presented in Volume II, Section II.3.1.1) defines specific actions that would reduce the impacts of this alternative. The conservation strategy includes definition of the reserve design and specific CMAs for the Preferred Alternative. While the CMAs were developed for BLM lands only, this analysis assumes that all CMAs would be applied also to nonfederal lands.

The CMAs applicable to paleontological resources listed under the Preferred Alternative—which includes (1) the paleontology CMA, (2) worker education, (3) standard practices for siting and design, (4) standard practices for hydrology and water resources, (5) standard practices for soil resources, and (6) certain landscape-level biological CMAs—would likewise apply to this alternative.

Laws and Regulations

Similar to the No Action Alternative, existing laws and regulations will reduce certain impacts of Plan implementation. Relevant regulations are presented in the Regulatory Setting in Volume III. The requirements of relevant laws and regulations are summarized for the No Action Alternative in Section IV.10.3.1.1.1. There are no other laws or regulations that would uniquely apply to this alternative.

Mitigation Measures

After implementation of the CMAs and existing laws and regulations, mitigation measures will be applied to further reduce some of the DRECP's adverse impacts. The paleontology CMA and certain Plan-wide biological CMAs (AM-PW3, AM-PW-5, AM-PW-9, AM-PW-10, and AM-PW-14) partially address the potential adverse effects identified. However, as under the Preferred Alternative, the paleontology CMA is not specific enough and does not clearly apply to nonfederal land. Implementation of Mitigation Measure PR-1a, as described in the Preferred Alternative (see Section IV.10.3.2.1.1), would ensure a consistent approach to assessment and mitigation and that the fossil-yield potential of the surface and subsurface is fully understood prior to construction.

IV.10.3.5.1.2 Impacts from Reserve Design

The impacts of the reserve design collectively refer to the designation and management of existing conservation areas (i.e., Legislatively and Legally Protected Areas and Military Expansion Mitigation Lands), BLM LUPA Conservation Designations, and reserves established within Conservation Planning Areas. Overall, of the 15,229,000 acres within the Alternative 3 Reserve Design Lands, 42% are within BLM LUPA Conservation Designations, 8% in the Conservation Planning Areas, and the remaining 50% in existing conservation areas. Of the BLM LUPA Conservation Designations under Alternative 3, 61% would be NLCS lands, 36% would be ACECs, and 2% would be wildlife allocations. The reserve design under Alternative 3 emphasizes the protection of Aeolian transport, riparian, and linkage areas in the Cadiz Valley and Chocolate Mountains ecoregion subarea, the U.S. Route 395 corridor, Fremont Valley, and Ridgecrest in addition to elements included in alternative-specific reserve design for the Preferred Alternative.

To the extent that such areas are newly established or expanded (i.e., beyond existing protected areas), the reserve design would be considered a beneficial impact on paleontological resources because renewable energy development would be precluded in these areas and because efforts to preserve wildlife, habitat, and ecologic values would likewise serve to protect paleontological resources. The Plan-wide distribution of PFYCs is 28%, 53%, and 18% for LVL, MU, and HVH, respectively. This generalized distribution of PFYCs within the reserve design indicates that in almost all circumstances—whether or not known paleontological resources are present—new or expanded reserve design elements would also serve to protect geologic units that are potentially fossil-yielding.

IV.10.3.5.2 Impacts of DRECP LUPA on BLM Land: Alternative 3

This section addresses two components of effects of the BLM LUPA: the streamlined development of renewable energy and transmission on BLM land under the LUPA and the impacts of the amended land use plans themselves.

IV.10.3.5.2.1 Impacts from Renewable Energy and Transmission Development on BLM Land

On BLM lands under the LUPA, Alternative 3 includes DFAs (213,000 acres) and transmission corridors where approximately 45,000 acres of ground disturbance–related impacts and operations impacts would occur.

Impact PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in Alternative 3 would be the same as described in the analysis of Plan-wide

impacts, but the location and extent of impacts would be restricted to BLM-administered land only. In addition, when potential footprint impacts of the DFAs are examined in the context of BLM-administered land only, a relatively minor fraction of the affected area is underlain by agricultural land uses, which (at least within near-surface soils) normally minimize the potential for adverse impacts to paleontological resources, even in areas that are underlain by fossil-yielding geologic units. Under the DRECP LUPA, renewable energy development on BLM lands in DFAs would be streamlined (i.e., permitted faster and with fewer steps). However, the speed or timing of renewable energy development ultimately does not affect the magnitude of potential paleontological impacts.

Table R2.10-11 presents the estimated BLM LUPA paleontological resource impacts by eco-region subarea. The estimated footprint impacts shown in Table R2.10-11 do not include the disturbance that could occur as a result of renewable energy transmission outside of the DFAs. However, the potential transmission corridors—while not located precisely—can roughly be expected to be underlain by geologic units with a PFYC distribution similar to that within the conceptual energy corridors. The distribution of PFYCs within conceptual energy corridors is 6%, 85%, and 9% for LVL, MU, and HVH, respectively. With respect to DFAs, the Imperial Borrego Valley ecoregion subarea would experience the greatest impacts, with an estimated 17,000 acres of potential land disturbance, 13% (2,000 acres) of which is within an HVH PFYC. The Cadiz Valley and Chocolate Mountains ecoregion sub-area would experience the next highest level of footprint impact, with 8,000 acres of poten-tial footprint impacts within DFAs, 31% of which (3,000 acres) is within an HVH PFYC. Although the Imperial Borrego Valley ecoregion subarea has a greater extent of estimated footprint impacts in this alternative, the Cadiz Valley and Chocolate Mountains ecoregion subarea would have the greatest impact to HVH PFYCs.

The mix of renewable energy technology on BLM-administered land under Alternative 3 would be focused more on solar and geothermal, with the types of impacts being as described in the Plan-wide analysis (IV.10.3.2.1.1), and the discussion of impacts typical to all alterna-tives (see Section IV.10.2.1).

Impact PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in Alternative 3 would be the same as described in the analysis of Plan-wide impacts (see Section IV.10.3.2.1.1), but the location and extent of impacts would be restricted to BLM-administered land only. The mix of renewable energy technology on BLM-administered land under Alternative 3 would be focused more on solar and geothermal, with the types of impacts being as described in the Plan-wide

analysis (see Section IV.10.3.2.1.1) and the discussion of impacts typical to all alternatives (see Section IV.10.2.1).

Impact PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in Alternative 3 would be the same as described in the analysis of Plan-wide impacts (see Section IV.10.3.2.1.1), but the location and extent of impacts would be restricted to BLM-administered land only. The mix of renewable energy technology on BLM-administered land under Alternative 3 would be focused more on solar and geothermal, with the types of impacts being as described in the Plan-wide analysis (see Section IV.10.3.2.1.1) and the discussion of impacts typical to all alternatives (see Section IV.10.2.1)

IV.10.3.5.2.2 Impacts of Changes to BLM Land Designations

The BLM LUPA would establish Conservation Designations on BLM-administered lands under each alternative that would conserve biological resources, including NLCS lands, ACECs, and wildlife allocations. On BLM-administered lands under Alternative 3, the BLM LUPA would designate approximately 5,055,000 acres of BLM LUPA Conservation Designations: 3,401,000 acres of NLCS lands, 1,641,000 acres of ACECs, and 13,000 acres of wildlife allocations. BLM LUPA Conservation Designation lands seek to include both ACECs and NLCS lands, with somewhat greater emphasis on NLCS lands.

To the extent that Conservation Designations are newly established or expanded (i.e., beyond existing protected areas), such BLM land designations would be considered a beneficial impact on paleontological resources because renewable energy development would be precluded in these areas and because efforts to preserve wildlife, habitat, and ecologic values would likewise serve to protect paleontological resources. The Plan-wide distribution of PFYCs is 28%, 53%, and 18% for LVL, MU, and HVH, respectively. This distribution of PFYCs Plan-wide indicates that in almost all circumstances—whether or not known paleontological resources are present—new or expanded reserve design elements would serve to protect geologic units that are potentially fossil-yielding.

Under Alternative 3, the following scientific values associated with paleontological and geologic resources would be added or increased within NLCS lands (but would not be included under the Preferred Alternative):

- Research opportunities and other scientific values in Fish Lake, Deep Springs, and Eureka valleys, and at the Trona Pinnacles, would not be included.

- National Conservation Lands would not include the paleontological values of Rainbow Basin or the Manix area.

However, the paleontological resources within these areas would continue to be protected in accordance with current policy, and there would be no DFAs proposed in these areas.

Expansion or designation of new ACECs, SRMAs, and NSHT Management Corridors, to the extent that they allow an increase in public accessibility or new/expanded open OHV areas, could adversely impact paleontological resources at the ground surface (no subsurface impacts). These would have the same effects as described under the No Action Alternative. Only the location and extent of SRMAs would change. Unit-specific SRMA worksheets are provided in Appendix L and the CMAs specific to lands managed to protect wilderness characteristics are provided as part of the Volume II descriptions of the DRECP alternatives.

IV.10.3.5.3 Impacts of Natural Community Conservation Plan: Alternative 3

The analysis of Covered Activities under the NCCP is equivalent to the Plan-wide analysis of the interagency alternatives. Reserve design features and other conservation actions under the NCCP alternatives represent more detailed categories of the reserve design under the interagency Plan-wide alternatives. These NCCP differences in reserve design features do not affect nonbiological resources analyzed in this document, and the analysis of reserve design and conservation and management actions under the NCCP is therefore equivalent to the Plan-wide analysis of the interagency alternatives, as described in Section IV.10.3.2.1.

IV.10.3.5.4 Impacts of General Conservation Plan: Alternative 3

The impacts of the GCP for Alternative 3 would be similar to those defined in Section IV.10.3.2.1 for the Plan-wide analysis, but they would occur on nonfederal lands only. On nonfederal lands under the GCP, Alternative 3 includes DFAs (1,175,000 acres) and transmission corridors where approximately 128,000 acres of ground disturbance–related impacts and operations impacts would occur. The distribution of fossil-yielding geologic units would be broadly similar to the Plan-wide distribution, with impacts from DFAs and benefits from conservation roughly proportional as well.

IV.10.3.5.5 Impacts Outside of Plan Area

IV.10.3.5.5.1 Impacts of Transmission Outside of Plan Area

The impacts of Outside of Plan Area transmission on paleontological resources would be the same under all alternatives. These impacts are as described for the No Action Alternative in Section IV.10.3.1.5.1.

IV.10.3.5.5.2 Impacts of BLM LUPA Decisions Outside of Plan Area

Under the proposed BLM LUPA, the only changes outside the Plan Area would be the designation of NLCS lands, ACECs, and NSHT Management Corridors, and Visual Resource Management Classes and new land allocations to replace multiple-use classes on CDCA lands. The nature and intensity of impacts on paleontological resources would be the same as those described in Section IV.10.3.1.5.2; though generally the impacts are limited to beneficial impacts associated with designation of NLCS lands, ACECs, and NSHT Management Corridors.

IV.10.3.5.6 CEQA Significance Determination for Alternative 3

PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources. Land disturbance associated with site characterization, construction, and decommissioning activities under Alternative 3, instead of continuing current trends and recent patterns of renewable development associated with existing and planned projects, would concentrate development into DFAs that are geographically dispersed. The paleontology CMA and certain Plan-wide biological CMAs (AM-PW3, AM-PW-5, AM-PW-9, AM-PW-10, and AM-PW-14) partially address the impact mechanisms identified. However, the paleontology CMA is not specific enough nor does it appear to be applicable Plan-wide (i.e., on nonfederal lands). For this reason, potential impacts to paleontological resources from renewable energy development on nonfederal lands could be significant without additional mitigation. However, implementation of Mitigation Measure PR-1a, as described in the Preferred Alternative (see Section IV.10.3.2.1.1), would ensure a consistent approach to assessment and mitigation and that the fossil-yield potential of the surface and subsurface is fully understood prior to construction. Potential adverse impacts would be less than significant with implementation of Mitigation Measure PR-1a.

PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context. Actions to avoid or minimize impacts on hydrology and erosion that are integrated into the DRECP, as discussed in Chapter IV.5, would likewise reduce the potential for impacts to paleontological resources to a less than significant level (e.g., AM-PW-9 and AM-PW-10). No mitigation is required.

PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism. The discussion and conclusions regarding this potential impact is the same as under the Preferred Alternative (see Section IV.10.3.2.6), which concludes that the impact is considered less than significant. No mitigation is required.

IV.10.3.5.7 Comparison of Alternative 3 with Preferred Alternative

Chapter IV.27 presents a comparison of all action alternatives and the No Action Alternative across all disciplines. This section summarizes the comparison of Alternative 3 with the Preferred Alternative.

IV.10.3.5.7.1 Alternative 3 Compared with Preferred Alternative for Plan-wide DRECP

As the same renewable energy generation goals would be met under both Alternative 3 and the Preferred Alternative, and only the geographic location of the development would change, the potential for impacts would increase or decrease only in terms of the geologic units affected (and their associated PFYCs). In addition, certain DFAs under Alternative 3 are in areas or geologic units already known to be fossil-yielding but to a lesser degree than the Preferred Alternative.

Although the exact location of development would not be known until individual projects are proposed, the footprint impacts of Alternative 3 are less likely to be within geologic units with an HVH PFYC (about 10,000 acres) compared with the Preferred Alternative (about 14,000 acres). As shown in Exhibit IV.10-1, the extent of footprint impacts would also be slightly greater overall under Alternative 3 compared with the Preferred Alternative. Alternative 3 concentrates development to a similar degree on private agricultural lands (about 32% of the DFAs). The DFAs of Alternative 3 would not intersect several known fossil-bearing geologic units that would be impacted under the Preferred Alternative. These include the Horned Toad Formation and the Bopesta Formation (West Mojave and Eastern Slope ecoregion subarea) and the fossil-bearing Paleozoic and Mesozoic sedimentary rocks in the Mountain Pass area where Interstate 15 crosses the Mescal Range (Kingston and Funeral Mountains ecoregion subarea).

Although the overarching analyses and conclusions under both alternatives with respect to paleontological resource impacts are the same, there would be a reduced potential to impact paleontological resources under Alternative 3 as compared with the Preferred Alternative.

IV.10.3.5.7.2 Alternative 3 Compared with Preferred Alternative for the BLM LUPA

As shown in Exhibit IV.10-2, estimated footprint impacts under Alternative 3 would be approximately 10,000 acres fewer than under the Preferred Alternative. Additionally, Alternative 3 would include less area underlain by geologic units with an HVH PFYC (in both absolute and relative terms). BLM LUPA Conservation Designation lands under Alternative 3 would roughly achieve the same result as the Preferred Alternative and thus have roughly equivalent impacts and benefits with respect to paleontological resources. Although the overarching analyses and conclusions under both alternatives with respect to

paleontological resource impacts are the same, there would be slightly less potential to impact paleontological resources on LUPA lands under Alternative 3.

IV.10.3.5.7.3 Alternative 3 Compared with Preferred Alternative for NCCP

The impacts of the NCCP for Alternative 3 are the same as those defined in Section IV.10.3.2.1 for the Plan-wide analysis. As a result, the comparison of Alternative 3 with the Preferred Alternative for the NCCP is the same as described for the Plan-wide DRECP.

IV.10.3.5.7.4 Alternative 3 Compared with Preferred Alternative for the GCP

Alternative 3 would allow renewable energy development on approximately 1.2 million acres of DFAs on nonfederal lands as compared with the approximately 1.6 million acres of DFAs on nonfederal lands under the Preferred Alternative. Under Alternative 3, the Reserve Design Lands would include approximately 2.9 million acres on nonfederal lands, compared with the Preferred Alternative, which includes approximately 2.7 million acres of Reserve Design Lands on nonfederal lands. Although the GCP under Alternative 3 includes much less area dedicated to DFAs, the ultimate extent of footprint impacts under both alternatives is similar (although Alternative 3 has slightly greater footprint impacts). Because Alternative 3 would include about 200,000 more acres of Reserve Design Lands, the beneficial effect on paleontological resources in the context of the CGP would be greater than it would be under the Preferred Alternative.

IV.10.3.5.7.5 Geographic Distinctions

The paleontological potential of specific geographic areas under Alternative 3—compared with the Preferred Alternative—would differ only to the extent the paleontological potential of the geologic units underlying developable areas differ. Specific geographic areas of potential interest to managing agencies include:

- The Silurian Valley (Mojave and Silurian Valley ecoregion subarea).
- The Pahrump Valley (Kingston and Funeral Mountains ecoregion subarea).
- The area north of Tehachapi (West Mojave and Eastern Slopes ecoregion subarea).
- The area east of Twentynine Palms (Providence and Bullion Mountains ecoregion subarea).
- Owens Lake (Owens River Valley ecoregion subarea).
- Searles Lake between Fort Irwin and China Lake (Panamint Death Valley ecoregion subarea).

- The area along U.S. Route 395 north of Edwards Air Force Base (West Mojave and Eastern Slopes ecoregion subarea).

Differences in the distribution of PFYCs are shown across each geographic ecoregion in Appendix R2.10. These differences are generally minor, as shown by comparing Tables R2.10-3 and R2.10-4 (Preferred Alternative) with Tables R2.10-10 and R2.10-11 (Alternative 3).

More localized differences between Alternative 3 and the Preferred Alternative in the geographic areas listed may exist, but the type and nature of impacts to paleontological resources would be the same. This is because fossil-yielding geologic units could be encountered under either alternative, and because any ground disturbance—even if confined to areas mapped as having an LVL PFYC—could result in significant impacts on fossils or fossil-bearing formations (e.g., in the subsurface). For example, the DFAs of Alternative 3 would not intersect several known fossil-bearing geologic units that would be impacted under the Preferred Alternative. These include the Horned Toad Formation and the Bopesta Formation (West Mojave and Eastern Slope ecoregion subarea), and the fossil-bearing Paleozoic and Mesozoic sedimentary rocks in the Mountain Pass area where Interstate 15 crosses the Mescal Range (Kingston and Funeral Mountains ecoregion subarea). However, under both alternatives, the impact conclusion and impact reduction strategies are the same.

While the underlying potential to impact fossil-yielding geologic units may differ between Alternative 3 and the Preferred Alternative in specific geographic regions, the impact conclusion under CEQA and NEPA, as well as the impact reduction strategies and mitigation measures would be the same.

IV.10.3.6 Alternative 4

The following sections provide the Plan-wide assessment of impacts and mitigation measures for renewable energy and transmission development for Alternative 4. Alternative 4 includes DFAs (1,608,000 acres) and transmission corridors where approximately 175,000 acres of ground disturbance–related impacts would occur and where operations impacts would occur. Alternative 4 includes DRECP Variance Lands, and these areas are not considered impacted or conserved in this analysis. Alternative 4 also includes geographically dispersed DFAs on public and private lands with an expected mix of solar technologies in the Cadiz Valley and Chocolate Mountains, wind in the West Mojave and Eastern Slopes, and geothermal in the Imperial Borrego Valley and Owens River Valley ecoregion subareas.

IV.10.3.6.1 Plan-wide Impacts of Implementing the DRECP: Alternative 4

This section provides the Plan-wide assessment of impacts of implementing the DRECP for Alternative 4. This Plan-wide assessment addresses the impacts and mitigation measures from renewable energy and transmission development and impacts of the reserve design.

IV.10.3.6.1.1 Plan-wide Impacts and Mitigation Measures From Renewable Energy and Transmission Development

Impact Assessment

Impact PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources.

The nature and intensity of paleontological resource impacts from renewable energy and transmission development under Alternative 4 would be the same as described in Section IV.10.2, but the location and extent of impacts would differ from the Preferred Alternative and Alternatives 1 through 3. Table R2.10-12 presents the estimated Plan-wide paleontological resource impacts by ecoregion subarea based on the general distribution of geologic formations (and their PFYCs) within DFAs, as well as the estimates of permanent disturbance presented in Volume II, Chapter II.3. The estimated footprint impacts shown in Table R2.10-12 do not include the disturbance that could occur as a result of renewable energy transmission outside of the DFAs. However, the potential transmission corridors—while not located precisely—can roughly be expected to be underlain by geologic units with a PFYC distribution similar to that within the conceptual energy corridors. The distribution of PFYCs within conceptual energy corridors is 2%, 83%, and 7% for LVL, MU, and HVH, respectively. (The remainder is mapped as water.)

Plan-wide, approximately 11% of the DFAs of Alternative 4 are underlain by geologic units with an HVH PFYC, 83% of the DFAs are underlain by geologic units with an MU PFYC, and approximately 3% of the DFAs are underlain by geologic units with an LVL PFYC. (The remaining 3% consists of water bodies.) The greatest degree of footprint impacts would be within the Imperial Borrego Valley ecoregion subarea, where 47,000 acres could experience ground disturbances, 3% of which (1,000 acres) could occur within areas with an HVH PFYC. This potential to impact geologic units with an HVH PFYC is relatively low compared with potential impacts in other ecoregion subareas, such as the Cadiz Valley and Chocolate Mountains (21%) and the Pinto Lucerne Valley and Eastern Slopes (13%) ecoregion subareas (and compared with the Plan Area generally). The West Mojave and Eastern Slopes and the Cadiz Valley and Chocolate Mountains ecoregion subareas both have the next greatest potential footprint impacts, 43,000 acres and 41,000 acres, respectively.

Some of the DFAs are in areas known as vertebrate fossil-yielding geologic units. In the eastern San Felipe Hills (Imperial Borrego Valley ecoregion subarea), fossil-bearing strata of the Palm Spring Group and Brawley Formation occur in areas where DFAs associated with all action alternatives are sited. In the Palo Verde Valley area and adjacent Palo Verde Mesa (Cadiz Valley and Chocolate Mountains ecoregion subarea), DFAs associated with the all five action alternatives are sited in areas underlain by known vertebrate fossil-bearing Pleistocene paleosols. Alternative 4 would also overlap with the Horned Toad Formation and the Bopesta Formation, in the Horned Toad Hills west of Mojave and east of Tehachapi and in the hills surrounding Tehachapi Valley (West Mojave and Eastern Slope ecoregion subarea). In addition, vertebrate fossil-bearing strata of the Barstow Formation northeast of Barstow and northwest of Daggett underlie parts of the DFAs (in the Mojave and Silurian Valley ecoregion subarea). As indicated in Table R2.10-12, many other areas may be underlain by fossil-yielding geologic units, but these provide some examples specific to Alternative 4.

This distribution of PFYCs within the DFAs indicate that in almost all circumstances—whether or not known paleontological resources are present—subsurface excavations associated with all technologies may impact geologic units that are potentially fossil-yielding. As shown in Table R2.10-12, the vast majority of the footprint impacts within the DFAs (94%) would be in areas underlain by geologic units with an MU or HVH PFYC. On the other hand, about 31% of the DFAs within Alternative 4 would be sited on agricultural land. In these areas, the potential for adverse impacts on paleontological resources is limited to deeper soils; surface disturbances and light grading would generally have a very low probability of affecting significant paleontological resources.

Regardless of the various nuances discussed above, renewable energy development under all alternatives and for all technologies could adversely impact paleontological resources as described in Section IV.10.2.

Impact PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context.

The typical effects with respect to erosion and soil loss are described in greater detail in Section IV.10.2, though the location and extent of impacts for Alternative 4 would differ somewhat from the Preferred Alternative and Alternatives 1 through 3. The potential for this type of impact to occur within the Plan Area would be proportional to the severity of hydrologic impacts discussed in Chapter IV.5. The analysis presented therein indicates all renewable energy technologies could have adverse effects on the rate of erosion, soil loss, or drainage patterns; but solar energy development would have the greatest potential for adverse impacts. Therefore, indirect impacts to paleontological resources may be greater

in areas emphasizing solar development, such as the Cadiz Valley and Chocolate Mountains ecoregion subarea as compared with the West Mojave and Eastern Slopes, the Imperial Borrego Valley, and the Owens River Valley ecoregion subareas, which emphasize wind and geothermal.

Substantial adverse impacts can be avoided or sufficiently minimized with compliance with applicable laws, ordinances, regulations, and standards. These include implementation of stormwater pollution prevention plan design criteria, monitoring water quality and waste-water management, and Clean Water Act and related state and local agency compliance. To the extent these actions reduce impacts on hydrology, drainage, and erosion (see Chapter IV.5), they would also reduce impacts on paleontological resources.

Impact PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism.

The nature and intensity of paleontological resource impacts from renewable energy and transmission development under Alternative 4 would be the same as described in Section IV.10.2, but the location and extent of impacts would differ somewhat from the Preferred Alternative and Alternatives 1 through 3. Typically, renewable energy transmission and development that is further removed from existing roads and transmission infrastructure would have a greater potential to increase unauthorized collection or vandalism. Potential transmission corridors conceptually identified under Alternative 4 tend to follow existing major roads, highways, and utility corridors; and the DFAs, being more concentrated, may require fewer transmission corridors. This means that public accessibility to currently inaccessible areas would not change greatly. Otherwise, the impacts described under the No Action Alternative (see Section IV.10.3.1) would be the same as the unauthorized-collection or vandalism impacts of Alternative 4.

Impacts in Study Area Lands

Future Assessment Areas. There are no FAAs in Alternative 4.

Special Analysis Areas. Designating the SAAs as conservation would have no impact on this resource. Impacts would be the same as those explained for the Plan-wide reserve design.

DRECP Variance Lands. DRECP Variance Lands represent the BLM Solar PEIS Variance Lands as screened for the DRECP and EIR/EIS based on BLM screening criteria. Covered Activities could be permitted for NCCP purposes only through an NCCP plan amendment. However, development of renewable energy on variance lands would not require a BLM Land Use Plan Amendment; so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of DRECP Variance Lands would impact paleontological resources in the same manner as discussed for the DFAs,

with the potential for impacts increasing in areas assigned to higher PFYCs. In almost all circumstances—whether or not known paleontological resources are present—subsurface excavations associated with all technologies may impact geologic units that are potentially fossil-yielding. The distribution of PFYCs within DRECP Variance Lands for Alternative 4 is 9% LVL, 55% MU and 37% HVH. This distribution is somewhat less favorable compared with the DFAs as a greater portion of DRECP Variance Lands is underlain by geologic units with HVH paleontological sensitivity.

Impact Reduction Strategies and Mitigation

Plan implementation would result in conservation of some desert lands as well as the development of renewable energy generation and transmission facilities on other lands. There are several ways in which the impacts of the renewable energy development covered by the Plan would be lessened. First, the Plan incorporates CMAs for each alternative, including specific biological reserve design components and LUPA components. Also, the implementation of existing laws, orders, regulations, and standards would reduce the impacts of project development. If significant impacts would still result after implementation of CMAs and compliance with applicable laws and regulations, then specific mitigation measures are recommended in this section.

Conservation and Management Actions

The conservation strategy for Alternative 4 (presented in Volume II, Section II.3.1.1) defines specific actions that would reduce the impacts of this alternative. The conservation strategy includes definition of the reserve design and specific CMAs for the Preferred Alternative. While the CMAs were developed for BLM lands only, this analysis assumes that all CMAs would be applied also to nonfederal lands.

The CMAs applicable to paleontological resources listed under the Preferred Alternative—which includes (1) the paleontology CMA, (2) worker education, (3) standard practices for siting and design, (4) standard practices for hydrology and water resources, (5) standard practices for soil resources; and (6) certain landscape-level biological CMAs—would likewise apply to this alternative.

Laws and Regulations

Similar to the No Action Alternative, existing laws and regulations will reduce certain impacts of Plan implementation. Relevant regulations are presented in the Regulatory Setting in Volume III. The requirements of relevant laws and regulations are summarized for the No Action Alternative in Section IV.10.3.1.1.1. There are no other laws or regulations that would uniquely apply to this alternative.

Mitigation Measures

After implementation of the CMAs and existing laws and regulations, no mitigation measures are necessary to further reduce some of the DRECP's adverse impacts. The paleontology CMA and certain Plan-wide biological CMAs (AM-PW3, AM-PW-5, AM-PW-9, AM-PW-10, and AM-PW-14) partially address the potential adverse effects identified. However, as under the Preferred Alternative, the paleontology CMA is not specific enough and does not clearly apply to nonfederal land. Implementation of Mitigation Measure PR-1a, as described in the Preferred Alternative (see Section IV.10.3.2.1.1), would ensure a consistent approach to assessment and mitigation and that the fossil-yield potential of the surface and subsurface is fully understood prior to construction.

IV.10.3.6.1.2 Impacts from Reserve Design

The impacts of the reserve design collectively refer to the designation and management of existing conservation areas (i.e., Legislatively and Legally Protected Areas and Military Expansion Mitigation Lands), BLM LUPA Conservation Designations, and reserves established within Conservation Planning Areas. Overall, of the 14,542,000 acres within the Alternative 4 Reserve Design Lands, 39% are within BLM LUPA Conservation Designations, 8% in the Conservation Planning Areas, and the remaining 53% are in existing conservation areas. Of the BLM LUPA Conservation Designations under Alternative 4, 54% would be NLCS lands, 38% would be ACECs, and 8% would be wildlife allocations.

To the extent that such areas are newly established or expanded (i.e., beyond existing protected areas), the reserve design would be considered a beneficial impact on paleontological resources because renewable energy development would be precluded in these areas and because efforts to preserve wildlife, habitat, ecologic, and cultural values would likewise serve to protect paleontological resources. The Plan-wide distribution of PFYCs is 28%, 53%, and 18% for LVL, MU, and HVH, respectively. This generalized distribution of PFYCs within the reserve design indicates that in almost all circumstances—whether or not known paleontological resources are present—new or expanded reserve design elements would also serve to protect geologic units that are potentially fossil-yielding.

IV.10.3.6.2 Impacts of DRECP LUPA on BLM Land: Alternative 4

This section addresses two components of effects of the BLM LUPA: the streamlined development of renewable energy and transmission on BLM land under the LUPA and the impacts of the amended land use plans themselves.

IV.10.3.6.2.1 Impacts from Renewable Energy and Transmission Development on BLM Land

On BLM lands under the LUPA, Alternative 4 includes DFAs (258,000 acres) and transmission corridors where approximately 50,000 acres of ground disturbance–related impacts and operations impacts would occur.

Impact PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in Alternative 4 would be the same as described in the analysis of Plan-wide impacts, but the location and extent of impacts would be restricted to BLM-administered land only. In addition, when potential footprint impacts of the DFAs are examined in the context of BLM-administered land only, a relatively minor fraction of the affected area is underlain by agricultural land uses, which (at least within near-surface soils) normally minimize the potential for adverse impacts to paleontological resources, even in areas that are underlain by fossil-yielding geologic units. Under the DRECP LUPA, renewable energy development on BLM lands in DFAs would be streamlined (i.e., permitted faster and with fewer steps). However, the speed or timing of renewable energy development ultimately does not affect the magnitude of potential paleontological impacts.

Table R2.10-13 presents the estimated BLM LUPA paleontological resource impacts by ecoregion subarea. The estimated footprint impacts shown in Table R2.10-13 do not include the disturbance that could occur as a result of renewable energy transmission outside of the DFAs. However, the potential transmission corridors—while not located precisely—can roughly be expected to be underlain by geologic units with a PFYC distribution similar to that within the conceptual energy corridors. The distribution of PFYCs within conceptual energy corridors is 5%, 80%, and 15% for LVL, MU, and HVH, respectively. With respect to DFAs, the Cadiz Valley and Chocolate Mountains ecoregion subarea would experience the greatest impacts, with an estimated 30,000 acres of potential land disturbance, 25% (8,000 acres) of which is within an HVH PFYC. The Imperial Borrego Valley ecoregion subarea would experience the next highest level of footprint impact, with 6,000 acres of potential footprint impacts within DFAs, 13% of which (700 acres) is within an HVH PFYC. The mix of renewable energy technology on BLM-administered land under Alternative 4 would be focused more on solar and geothermal, with the types of impacts being as described in the Plan-wide analysis (IV.10.3.2.1.1) and the discussion of impacts typical to all alternatives (see Section IV.10.2.1).

Impact PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in Alternative 4 would be the same as described in the analysis of Plan-wide impacts (see Section IV.10.3.2.1.1), but the location and extent of impacts would be restricted to BLM-administered land only. The mix of renewable energy technology on BLM-administered land under Alternative 4 would be focused more on solar and geothermal, with the types of impacts being as described in the Plan-wide analysis (see Section IV.10.3.2.1.1) and the discussion of impacts typical to all alternatives (see Section IV.10.2.1).

Impact PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism.

The nature and intensity of paleontological resource impacts on BLM lands of existing BLM land use plans in Alternative 4 would be the same as described in the analysis of Plan-wide impacts (see Section IV.10.3.2.1.1), but the location and extent of impacts would be restricted to BLM-administered land only. The mix of renewable energy technology on BLM-administered land under Alternative 4 would be focused more on solar and geothermal, with the types of impacts being as described in the Plan-wide analysis (see Section IV.10.3.2.1.1) and the discussion of impacts typical to all alternatives (see Section IV.10.2.1).

IV.10.3.6.2.2 Impacts of Changes to BLM Land Designations

The BLM LUPA would establish Conservation Designations on BLM-administered lands under each alternative that would conserve biological resources, including NLCS lands, ACECs, and wildlife allocations. On BLM-administered lands under Alternative 4, the BLM LUPA would designate approximately 4,460,000 acres of BLM LUPA Conservation Designations: 2,652,000 acres of NLCS lands, 1,533,000 acres of ACECs, and 276,000 acres of wildlife allocations.

To the extent that Conservation Designations are newly established or expanded (i.e., beyond existing protected areas), such BLM land designations would be considered a beneficial impact on paleontological resources because renewable energy development would be precluded in these areas and because efforts to preserve wildlife, habitat, and ecologic values would likewise serve to protect paleontological resources. The Plan-wide distribution of PFYCs is 28%, 53%, and 18% for LVL, MU, and HVH, respectively. This distribution of PFYCs Plan-wide indicates that in almost all circumstances—whether or not known paleontological resources are present—new or expanded reserve design elements would serve to protect geologic units that are potentially fossil-yielding.

Scientific values of National Conservation Lands in Alternative 4 would include the paleontological values of Rainbow Basin, and not those of the Manix area, as compared with Preferred Alternative. However, the paleontological resources within these areas would continue to be protected in accordance with current policy, and there would be no DFAs proposed in these areas.

Expansion or designation of new ACECs, SRMAs, and NSHT Management Corridors, to the extent that they allow an increase in public accessibility or new/expanded open OHV areas, could adversely impact paleontological resources at the ground surface (no subsurface impacts). These would have the same effects as described under the No Action Alternative. Only the location and extent of SRMAs would change. Unit-specific SRMA worksheets are in Appendix L, and the CMAs specific to lands managed to protect wilderness characteristics are provided as part of the Volume II descriptions of the DRECP alternatives.

IV.10.3.6.3 Impacts of Natural Community Conservation Plan: Alternative 4

The analysis of Covered Activities under the NCCP is equivalent to the Plan-wide analysis of the interagency alternatives. Reserve design features and other conservation actions under the NCCP alternatives represent more detailed categories of the reserve design under the interagency Plan-wide alternatives. These NCCP differences in reserve design features do not affect nonbiological resources analyzed in this document; and the analysis of reserve design and conservation and management actions under the NCCP is therefore equivalent to the Plan-wide analysis of the interagency alternatives, as described in Section IV.10.3.2.1.

IV.10.3.6.4 Impacts of General Conservation Plan

The impacts of the GCP for Alternative 4 would be similar to those defined in Section IV.10.3.2.1 for the Plan-wide analysis, but they would occur on nonfederal lands only. On nonfederal lands under the GCP, Alternative 4 includes DFAs (1,333,000 acres) and transmission corridors where approximately 122,000 acres of ground disturbance–related impacts and operations impacts would occur. The distribution of fossil-yielding geologic units would be broadly similar to the Plan-wide distribution, with impacts from DFAs and benefits from conservation roughly proportional as well.

IV.10.3.6.5 Impacts Outside of Plan Area

IV.10.3.6.5.1 Impacts of Transmission Outside of Plan Area

The impacts of Outside of Plan Area transmission on paleontological resources would be the same under all alternatives. These impacts are as described for the No Action Alternative in Section IV.10.3.1.5.1.

IV.10.3.6.5.2 Impacts of BLM LUPA Decisions Outside of Plan Area

Under the proposed BLM LUPA, the only changes outside the Plan Area would be the designation of NLCS lands, ACECs, and NSHT Management Corridors, and Visual Resource Management Classes and new land allocations to replace multiple-use classes on CDCA lands. The nature and intensity of impacts on paleontological resources would be the same as those described in Section IV.10.3.1.5.2, though generally the impacts are limited to beneficial impacts associated with designation of NLCS lands, ACECs, and NSHT Management Corridors.

IV.10.3.6.6 CEQA Significance Determination for Alternative 4

PR-1: Land disturbance could result in loss, damage, or destruction of significant paleontological resources. Land disturbance associated with site characterization, construction, and decommissioning activities under Alternative 4, instead of continuing current trends and recent patterns of renewable development associated with existing and planned projects, would concentrate development into DFAs. The paleontology CMA and certain Plan-wide biological CMAs (AM-PW3, AM-PW-5, AM-PW-9, AM-PW-10, and AM-PW-14) partially address the impact mechanisms identified. However, the paleontology CMA is not specific enough nor does it appear to be applicable Plan-wide (i.e., on nonfederal lands). For this reason, potential impacts to paleontological resources from renewable energy development on nonfederal lands could be significant without additional mitigation. However, implementation of Mitigation Measure PR-1a, as described in the Preferred Alternative (see Section IV.10.3.2.1.1), would ensure a consistent approach to assessment and mitigation and that the fossil-yield potential of the surface and subsurface is fully understood prior to construction. Potential adverse impacts would be less than significant with implementation of Mitigation Measure PR-1a.

PR-2: Construction and operations activities could increase the rate of erosion or alter drainage patterns removing significant paleontological resources from their context. Actions to avoid or minimize impacts on hydrology and erosion that are integrated into the DRECP, as discussed in Chapter IV.5, would likewise reduce the potential for impacts to paleontological resources to a less than significant level (e.g., AM-PW-9 and AM-PW-10). No mitigation is required.

PR-3: Increased human access to significant paleontological resources could result in unauthorized collection or vandalism. The discussion and conclusions regarding this potential impact is the same as under the Preferred Alternative (see Section IV.10.3.2.6), which concludes that the impact is considered less than significant. No mitigation is required.

IV.10.3.6.7 Comparison of Alternative 4 with Preferred Alternative

Chapter IV.27 presents a comparison of all action alternatives and the No Action Alternative across all disciplines. This section summarizes the comparison of Alternative 4 with the Preferred Alternative.

IV.10.3.6.7.1 Alternative 4 Compared with Preferred Alternative for Plan-wide DRECP

As the same renewable energy generation goals would be met under both Alternative 4 and the Preferred Alternative, and only the geographic location of the development would change, the potential for impacts would increase or decrease only in terms of the geologic units affected (and their associated PFYCs). In addition, certain DFAs under Alternative 4 are in areas or geologic units already known to be fossil-producing but only to a slightly lesser degree than under the Preferred Alternative.

Although the exact location of development would not be known until individual projects are proposed, the footprint impacts of Alternative 4 are more likely to be within geologic units with an HVH PFYC (about 16,000 acres) compared with the Preferred Alternative (about 14,000 acres). As shown in Exhibit IV.10-1, the extent of footprint impacts would also be slightly greater overall under Alternative 4 compared with the Preferred Alternative. Furthermore, Alternative 4 concentrates development to a similar extent on private agricultural lands (about 31% of the DFAs) as the Preferred Alternative. In addition, the DFAs of Alternative 4 would not intersect several known fossil-bearing geologic units that would be impacted under the Preferred Alternative, including the vertebrate fossil-bearing strata of the Barstow Formation (Mojave and Silurian Valley ecoregion subarea).

The overarching analyses and conclusions under both alternatives with respect to paleontological resource impacts are the same, and both alternatives would have similar impacts with respect to the distribution of PFYCs within DFAs.

IV.10.3.6.7.2 Alternative 4 Compared with Preferred Alternative for the BLM LUPA

As shown in Exhibit IV.10-2, estimated footprint impacts under Alternative 4 would be about 12,000 acres greater than under the Preferred Alternative. In addition, Alternative 4 would include a slightly greater area underlain by geologic units with an HVH PFYC (in both absolute and relative terms). Though the overarching analyses and conclusions under both alternatives with respect to paleontological resource impacts are the same, there would be a somewhat greater potential to impact paleontological resources on LUPA lands under the Preferred Alternative.

IV.10.3.6.7.3 Alternative 4 Compared with Preferred Alternative for NCCP

The impacts of the NCCP for Alternative 4 are the same as those defined in Section IV.10.3.2.1 for the Plan-wide analysis. As a result, the comparison of Alternative 4 with the Preferred Alternative for the NCCP is the same as described for the Plan-wide DRECP.

IV.10.3.6.7.4 Alternative 4 Compared with Preferred Alternative for the GCP

Alternative 4 would allow renewable energy development on approximately 1.3 million acres of DFAs on nonfederal lands as compared with the approximately 1.6 million acres of DFAs on nonfederal lands under the Preferred Alternative. Under Alternative 4, the Reserve Design Lands would include approximately 2.8 million acres on nonfederal lands, compared with the Preferred Alternative that includes approximately 2.7 million acres. Although the GCP under Alternative 4 includes much fewer areas dedicated to DFAs, the ultimate extent of footprint impacts under both alternatives is similar (although Alternative 4 has greater footprint impacts on nonfederal land). Because Alternative 4 would include about 100,000 more acres of Reserve Design Lands, the beneficial effect on paleontological resources in the context of the CGP would be greater than under the Preferred Alternative.

IV.10.3.6.7.5 Geographic Distinctions

The paleontological potential of specific geographic areas under Alternative 4—compared with the Preferred Alternative—would differ only to the extent the paleontological potential of the geologic units underlying developable areas differ. Specific geographic areas of potential interest to managing agencies include:

- The Silurian Valley (Mojave and Silurian Valley ecoregion subarea).
- The Pahrump Valley (Kingston and Funeral Mountains ecoregion subarea).
- The area north of Tehachapi (West Mojave and Eastern Slopes ecoregion subarea).
- The area east of Twentynine Palms (Providence and Bullion Mountains ecoregion subarea).
- Owens Lake (Owens River Valley ecoregion subarea).
- Searles Lake between Fort Irwin and China Lake (Panamint Death Valley ecoregion subarea).
- The area along U.S. Route 395 north of Edwards Air Force Base (West Mojave and Eastern Slopes ecoregion subarea).

Differences in the distribution of PFYCs are shown across each geographic ecoregion in Appendix R2.10. These differences are generally minor, as shown by comparing Tables R2.10-3 and R2.10-4 (Preferred Alternative) with Tables R2.10-12 and R2.10-13 (Alternative 4).

More localized differences between Alternative 4 and the Preferred Alternative in the geographic areas listed above may exist, but the type and nature of impacts to paleontological resources would be the same. This is because fossil-yielding geologic units could be encountered under either alternative, and because any ground disturbance—even if confined to areas mapped as having an LVL PFYC—could result in significant impacts on fossils or fossil-bearing formations (e.g., in the subsurface). For example, the DFAs of Alternative 4 would not intersect several known fossil-bearing geologic units that would be impacted under the Preferred Alternative, including the vertebrate fossil-bearing strata of the Barstow Formation (Mojave and Silurian Valley ecoregion subarea). However, under both alternatives, the impact conclusion and impact reduction strategies are the same.

While the underlying potential to impact fossil-yielding geologic units may differ between Alternative 4 and the Preferred Alternative in specific geographic regions, the impact conclusion under CEQA and NEPA, as well as the impact reduction strategies and mitigation measures, would be the same.

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