APPENDIX A

DRECP Baseline Biology Report Metadata

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The following provides a description of the primary data layers used in the preparation of the Desert Renewable Conservation Plan (DRECP) Baseline Biology Report. This list includes the primary biological datasets used for the Baseline Biology Report but is not intended to be an exhaustive list of all databases or sources consulted. The References Cited section of the Baseline Biology Report provides a full listing of references used in preparing the Baseline Biology Report. Each of these data layers has additional metadata, which is not provided here, that provides technical geographic information system (GIS) information on spatial details (e.g., coordinate system) and attributes.

Data Layer	Metadata Description
USFWS-Designated Critical Habitat	These data identify, in general, the areas where final critical habitat exists for species listed as endangered or threatened. Designated Critical Habitat includes areas considered essential for the conservation of federally listed species. These areas provide notice to the public and land managers of the importance of these areas to the conservation of this species. Special protections and/or restrictions are possible in areas where federal funding, permits, licenses, authorizations, or actions occur or are required.
DRECP Initial LCover	The DRECP initial land cover dataset is a 100-meter composite layer developed by combining California Gap Vegetation (U.S. Geological Survey [USGS] GAP Program, Lennartz et al. 2008) with California Farmland Mapping and Monitoring Program (FMMP) data (California Department of Conservation 2009) and the results of the rural lands model to identify land use changes associated with agriculture and rural land uses. A full description of the classification system, vegetation types, and other land cover types used for the initial land cover map was provided in the DRECP Framework Conservation Strategy Report (May 2011). Mapping according to Lennartz et al. 2008 unless updated with FMMP or rural lands model results. FMMP categories used for the initial land cover map included Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. These areas are primarily used for the production of annual crops. Agricultural plant cover is variable, depending on season and type of farming. Other areas include more stable land cover of orchards and vineyards. Rural: A rural land cover type was developed for the DRECP based on a rural lands model. Rural land uses occur on private lands and have road access. To identify areas with rural land uses, the roads data (ESRI 2010), which is a linear data format at 1:15,000 scale, was used to create polygons, where larger polygons bounded by roads were considered less rural and smaller polygons were considered more rural. The road polygons were then classified into even size classes (e.g., 0 to 100 acres, 101 to 200 acres), and displayed as a GIS overlay on the current aerial imagery of the Plan Area. Review and inspection of the pattern and correspondence of polygon size to evidence of rural land use on aerial images indicated that most rural land uses occur where the road polygons were 500 acres or smaller in size. Therefore, the areas of 500 acres or smaller, road-bounded polygons that occur on private land, were classified as Rural. These modeled rural lands were incorporated into the DRECP land cover data layer to replace natural land cover, but were not incorporated if the land cover was mapped as farmland, urban, or disturbed from the FMMP data source. Areas with higher-density rural roads that divide the landscape into areas of 500 acres or less; include

Data Layer	Metadata Description
	rural residential lands and semi-agricultural and rural commercial lands such as farmsteads, agricultural storage and packing sheds, unpaved parking areas, composting facilities, equine facilities, firewood lots, and campgrounds.
West Mojave Vegetation	Vegetation mapping conducted by the Vegetation Classification and Mapping Program of California Department of Fish and Game (CDFG) in a portion of the West Mojave region. Vegetation was mapped according to the National Vegetation Classification System (NVCS) generally at the alliance level. Several additional vegetation attributes are included in the dataset such as cover classes in different strata and disturbance factors.
Named Dune Areas	Based on land cover data, surficial geology data, and aerial photography, a named dunes layer was created for DRECP to identify the location of dune formations and other sand resources in the DRECP.
Bighorn Sheep Mountain Habitat	Represents suitable mountain habitat for bighorn sheep based on CDFG unpublished data 2011.
Bighorn Sheep Intermountain Habitat	Represents intermountain habitat for bighorn sheep based on California Department of Fish and Game unpublished data 2011.
Bighorn Sheep Critical Linkage Areas	Represents critical linkage areas for bighorn sheep based on CDFG unpublished data 2011.
Carbonate Plant Habitat Areas	Mapping of occupied, suitable, and beneficial habitats per the Carbonate Habitat Management Strategy. This is considered a narrow range species element. Includes the habitat areas identified in the Carbonate Habitat Management Strategy and the BLM portion of these areas as identified in the BLM West Mojave Plan.
Highest-Value Contiguous Desert Tortoise Habitat	USFWS models based on USGS 2009 model. This is considered an umbrella species element. Identifies areas within the Mojave Desert that USFWS considers necessary for the reserve design in the DRECP. Method for creation: The layer is derived using four layers produced by the Desert Tortoise Recovery Office. These base layers were then processed using various tools in Arc Toolbox to arrive at the final layer. The following provides a brief description of each layer. "contigHab_imp_HC": The output of this model depicts the areas of contiguous, highest - value habitat for the Mojave desert tortoise. The areas of highest value are those of highest habitat potential (as modeled in Nussear et al. 2009) that are adjacent to other areas of highest habitat potential. Nussear et al. (2009) developed a model of habitat suitability for the tortoise using presence data and 16 environmental variables to predict potential areas of desert tortoise habitat throughout its geographic range at a 1 km2 scale. Their analysis did not account for anthropogenic changes that may have altered habitat with relatively high potential, turning them into areas with lower potential. We therefore utilized 1) the National Landcover Dataset impervious surfaces layer and 2) The Nature Conservancy's "highly converted areas" (TNC Mojave Ecoregional Assessment 2010; TNC Sonoran Ecoregional Assessment 2009) to change heavily developed areas where tortoises cannot occur to zero habitat potential. The highly converted layer depicts urban, suburban, and agricultural lands that have been heavily altered. Our model first finds areas with a 1.0 habitat potential probability, then iteratively adds adjacent areas with a lower potential starting with 0.9 down

Data Layer	Metadata Description
	to 0.6. The output consists of all areas down to 0.6 that can be reached from any 1.0 area, with no unconnected "habitat islands." habitatCorr_dvaly; "CorridorExtent"**:** The output of this model depicts the regions, or "corridors," of least cost for Mojave Desert tortoises between existing tortoise conservation areas (TCAs) as depicted in the Revised Recovery Plan for the Desert Tortoise (USFWS 2011, Figure 2). The least-cost corridor for a tortoise is the region of highest habitat potential (as modeled by Nussear et al. 2009) with the least accumulated "cost" to travel between the TCAs. Nussear et al. (2009) developed a model of habitat suitability for the Mojave Desert tortoise using presence data and 16 environmental variables to predict potential areas of desert tortoise habitat throughout its geographic range at a 1 km2 scale. Their analysis did not account for anthropogenic changes that may have altered habitat with relatively high potential, turning them into areas with lower potential. We therefore utilized The Nature Conservancy's "highly converted areas" (TNC Mojave Ecoregional Assessment 2010; TNC Sonoran Ecoregional Assessment 2009) to change heavily developed areas where tortoises cannot occur to zero habitat potential. The highly converted layer depicts urban, suburban, and agricultural lands that have been heavily altered. Our model estimates the least cost corridors between existing tortoise conservation areas (as defined in USFWS 2011). We calculated the least-cost corridors between these conservation areas based on pairs that were closest to one another. This resulted in 17 pairs, which corresponded to the main routes identified by Hagerty et al. (2010). The least-cost corridors for each of these 17 pairs was calculated as the accumulated cost associated with moving from cell to cell, given that higher habitat potential is assumed to have a lower cost. The least-cost corridor may not necessarily be the shortest physical distance between the two conservation areas. The output consists of the top 1% of suitable areas between each TCA pair. Contiguous B; "contigAll_poly": The output of this model depicts the areas of contiguous, highest-value habitat for the Mojave Desert tortoise. The areas of highest value are those of highest habitat potential (as modeled in Nussear et al. 2009) that are adjacent to other areas of highest habitat potential. Nussear et al. (2009) developed a model of habitat suitability for the tortoise using presence data and 16 environmental variables to predict potential areas of desert tortoise habitat throughout its geographic range at a 1 km2 scale. Their analysis did not account for anthropogenic changes that may have altered habitat with relatively high potential, turning them into areas with lower potential. We therefore utilized The Nature Conservancy's "highly converted areas" (TNC Mojave Ecoregional Assessment 2010; TNC Sonoran Ecoregional Assessment 2009) to change heavily developed areas where tortoises cannot occur to zero habitat potential. The highly converted layer depicts urban, suburban, and agricultural lands that have been heavily altered. Our model first finds areas with a 1.0 habitat potential probability, then iteratively adds adjacent areas with a lower potential starting with 0.9 down to 0.7. The output consists of all areas down to 0.7 that can be reached from any 1.0 area, with no unconnected "habitat islands." "SW_TortoiseConservationAreas": The SW_TCA layer is a mosaic of data including the Arizona, California, Nevada, and Utah ACECs, the DWMA, the Red Cliffs Desert Reserve, the Desert Tortoise Conservation Center, the Desert National Wildlife Refuge, State and National Parks, Beaver Dam Wash National Conservation Area, and the Boulder City Conservation Easement. ***Processing*** 1. The "erase" tool from Arc Toolbox was used to erase all areas of the

Data Layer	Metadata Description
	contigHab_imp_HC that were overlapped by TCAs as depicted in the **SW_TortoiseConservationAreas** layer (TCAs are identified in the attributes table of this layer with a "y" under the Tort_Map column). This revised layer depicted all areas of the **contigHab_imp_HC** that occur outside of TCAs. 2. The "clip" tool from Arc Toolbox was used to clip the **contigAll_poly** layer using the **SW_TortoiseConservationAreas** layer. This revised layer depicted all portions of the **contigAll_poly** layer that occurred within TCAs. 3. The impervious surfaces layer from the National Landcover Dataset (see description of **contigHab_imp_HC**, above) was used along with the "erase" tool in Arc Toolbox to erase all portions of the **CorridorExtent** layer that were overlapped by development displayed in the impervious surfaces data set. 4. The revised layers described above (1 through 3) were merged using the "merge" tool in Arc Toolbox to arrive at a range-wide desert tortoise reserve design. 5. This range-wide design was then clipped to the DRECP boundaries using the "clip" tool in Arc Toolbox. This revised layer depicts the portion of the range-wide desert tortoise reserve design that occurred inside the DRECP Plan boundary. 6. Because military installations and OHV areas were not going to be considered for development or reserve areas in the DRECP, the "erase" tool in Arc Toolbox was used to remove these areas. The final layer represents USFWS's initial reserve design for the desert tortoise in the DRECP planning process. Further refinement of the layer may occur after release of the PCS. In particular, identification of a more comprehensive urban layer and human development layer would allow us to refine some areas currently identified as part of the reserve that have significant amounts of fragmentation and habitat loss (e.g., Morongo Basin Area). While some of this was done in this layer, more accurate development layers would provide a better final design.
Mohave Ground Squirrel Conservation and Recovery Area	Mapping based on parts of historic range, current known population, and population centers and proposed linkages. This is considered an umbrella species element. Draft Conservation Plan boundary for the Mojave ground squirrel for the DRECP (8/2011). These areas are based on Mohave Ground Squirrel Core Areas and Populations and other survey efforts from 1998 to 2009. Polygons identify known current habitat and occurrences of the Mohave ground squirrel, as well as additional existing, adjacent habitat that may hold the potential for recovery and aid in long-term survival of the species if protected. It also identifies areas where rehabilitation of habitat should occur, or where surveys are needed to assess occurrence. In addition, one area is identified here as likely having false-positive occurrence records, and is identified instead as a good area for renewable energy development in terms of Mohave ground squirrel. ** Mohave ground squirrel core areas and populations metadata follows ** The Mohave ground squirrel is found only in the Western Mojave Desert of California. Although it is listed as threatened by the State of California, there is little published information regarding its current distribution and status. An analysis of 198 positive records identified four core areas that continue to support relatively abundant Mohave ground squirrel populations and four other areas in which there are multiple recent records of the species.

Data Layer	Metadata Description
	The Mohave Ground Squirrel Core Area is comprised of data collected over the past 10 years, which has made it possible to identify four areas within the range of the Mohave ground squirrel that still support relatively abundant and widespread populations. These core areas are defined by three criteria. First, there must be evidence that Mohave ground squirrel populations have persisted for a substantial period of time, on the order of two to three decades. Second, the species must be currently found at a minimum of six locations throughout the area. Third, the total number of individuals detected since 1998 must be less than 30. The four areas that are currently known to satisfy these criteria are Coso/Olancha, Little Dixie Wash, Coolgardie Mesa/Superior Valley, and Edwards Air Force Base. These four core areas total about 1,672 km^2, or about 8.4% of the entire historic range. During the period of 1998–2007, there have been 135 positive records in core areas, accounting for 68.2% of the total 198 positive records. It is important to emphasize that these identified core areas are simply the only important population centers that have been identified thus far. There are very likely other core areas in parts of the geographic range that have not been adequately sampled in the last 10 years. Purpose is to display areas of importance for the survival of the Mojave ground squirrel in the desert region of California.
Proposed Critical Habitat for Southwestern Willow Flycatcher	Based on proposed USFWS critical habitat designation for the species. This is considered an umbrella species element. Polygon shapefile depicting the critical habitat for the Southwestern willow flycatcher. The geographic extent includes counties in California, Nevada, Arizona, Utah, Colorado, and New Mexico. The GIS files and their associated coordinates are not the legal source for determining the critical habitat boundaries. Inherent in any data set used to develop graphical representations are limitations of accuracy as determined by, among others, the source, scale, and resolution of the data. While USFWS makes every effort to represent the critical habitat shown with this data as completely and accurately as possible (given existing time and resource constraints), USFWS gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data. In addition, USFWS shall not be held liable for improper or incorrect use of the data described or contained herein. Graphical representations provided by the use of this data do not represent a legal description of the critical habitat boundary. The user is referred to the critical habitat textual description in the appropriate final rule for this species as published in the Federal Register in 2011.
Soil parent material	California Geology Units from Jennings 1977 Geologic map of California. (California Division of Mines)
Soil Texture	Soil texture comes from the USDA National Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO). SSURGO Soils Survey - processed for Depth to Any Soil Restrictive Layer, Depth to Water Table, Drainage Class, Ecological Site Name, Hydric Rating, Map Unit Name, Parent Material Name, Soil Taxonomy and Surface Texture.
Landform	Landform is derived from the Land Facet tool using USGS digital elevation model (DEM) data. This data layer classifies areas as ridgelines, plains, valleys, or slopes.

Data Layer	Metadata Description
Elevation Range, Percent Slope, and Aspect	Elevation range, percent slope, and aspect are derived from the USGS 30 Meter Digital Elevation Model (DEM).
Hydrology	The National Hydrography Dataset (NHD) is a feature-based database that interconnects and uniquely identifies the stream segments or reaches that make up the nation's surface water drainage system. NHD data was originally developed at 1:100,000-scale and exists at that scale for the whole country. This high-resolution NHD, generally developed at 1:24,000/1:12,000 scale, adds detail to the original 1:100,000-scale NHD. (Data for Alaska, Puerto Rico and the Virgin Islands was developed at high-resolution, not 1:100,000 scale.) Local resolution NHD is being developed where partners and data exist. The NHD contains reach codes for networked features, flow direction, names, and centerline representations for areal water bodies. Reaches are also defined on waterbodies and the approximate shorelines of the Great Lakes, the Atlantic and Pacific Oceans and the Gulf of Mexico. The NHD also incorporates the National Spatial Data Infrastructure framework criteria established by the Federal Geographic Data Committee.
Wetlands	This data set represents the extent, approximate location and type of wetlands and deep-water habitats in the conterminous United States. These data delineate the areal extent of wetlands and surface waters as defined by Cowardin et al. (1979). Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and near shore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery. By policy, the Service also excludes certain types of "farmed wetlands" as may be defined by the Food Security Act or that do not coincide with the Cowardin et al. definition. Contact the Service's Regional Wetland Coordinator for additional information on what types of farmed wetlands are included on wetland maps.
Watershed	The California Interagency Watershed Map of 1999 (updated May 2004, "calw221") is the State of California's working definition of watershed boundaries. Previous Calwater versions (1.2 and 2.2) described California watersheds, beginning with the division of the State's 101 million acres into ten Hydrologic Regions (HR). Each HR is progressively subdivided into six smaller, nested levels: the Hydrologic Unit (HU, major rivers), Hydrologic Area (HA, major tributaries), Hydrologic Sub-Area (HSA), Super Planning Watershed (SPWS), and Planning Watershed (PWS). At the Planning Watershed (the most detailed level), where implemented, polygons range in size from approximately 3,000 to 10,000 acres. At all levels, a total of 7035 polygons represent the State's watersheds. The present version, Calwater 2.2.1, refines the watershed coding structure and documentation (database fields were added and some were renamed). There are significant watershed boundary, code, and name differences between Calwater versions 1.2 (1995), 2.0 (1998), and 2.2 (1999). The differences between versions 2.2 (1999) and 2.2.1 (2004) are attribute field names and some inserted lines that identify differences between State and federal watersheds. Calwater 2.2.1 most accurately delineates true watersheds in mountainous terrain. However, neither Calwater 2.2.1 nor any of its predecessors is a "pure" watershed map because administrative boundaries such as the State border were used to delineate watershed areas. Some of the boundaries, particularly in developed valley areas, also have legal and administrative purposes other than the representation of actual drainage divides. Examples include the so-called "Legal Delta"

Data Layer	Metadata Description
	(California Water Code, Chapter 2, the Delta, Sec. 12220) and other district boundaries. Neither is Calwater a legal map document, as it does not represent State of California Regional Water Quality Control Board (RWQCB) jurisdictions, officiated by the State Water Resources Control Board (SWRCB) under California Water Code Section 13200. Calwater is a hybrid, a spatial cross-reference for use in local, State, and federal information communities. The California Resources Agency (CRA) Department of Forestry and Fire Protection (CDF) contracted with Tierra Data Systems for the original digital production in 1993, based on Hydrologic Basin Planning Maps published in hardcopy (SWRCB, 1986). The State of California Stephen P. Teale Data Center GIS Solutions Group (Teale) under the direction of the California Department of Water Resources (DWR) and CDF, finalized the current version in ESRI ArcInfo coverage format in 1999 with USDA Forest Service and RWQCB/SWRCB inputs. The CRA California Spatial Information Library (CaSIL) is the current distributor of the coverage in the Teale Albers Conical Equal-Area projection, North American Datum of 1983. The California Department of Fish and Game (DFG) authored Calwater attribution design and documentation culminating in May 2004 with this Federal Geographic Data Committee (FGDC-STD-001-1998) standard metadata.
Ecoregion Subsection	This layer contains polygon features of Ecological Units for the state of California as described by ECOMAP (1993),.. "Ecological types are classified and ecological units are mapped based on associations of those biotic and environmental factors that directly affect or indirectly express energy, moisture, and nutrient gradients which regulate the structure and function of ecosystems. These factors include climate, physiography, water, soils, air, hydrology, and potential natural communities."
Audubon and Cornell Lab of Ornithology. eBird Database. May 3, 2011.	Verified occurrence data for bird observations from eBird.
Audubon golden eagle database. 2010.	Dataset of golden eagle observations provided by Audubon.
BLM Golden Eagle Database from CDFG.	Dataset of golden each observations provided by BLM.
BLM, El Centro Office. Flat-tailed horned lizard Occurrence database. 2006.	Dataset of flat-tailed horned lizard provided by BLM.
BLM. Flat-tailed horned lizard database. 2001.	Dataset of flat-tailed horned lizard provided by BLM.
BLM, Ocotillo Wells Office. Flat-tailed horned	Dataset of flat-tailed horned lizard provided by BLM.

Data Layer	Metadata Description
lizard database. 2007.	
BLM, California Desert District. NECO Occurrence Database (1949-1998)	Dataset of species observations provided by BLM.
BLM, California Desert District. WEMO Animal, primarily bird, and plant sightings (1968–1996).	Dataset of species observations provided by the BLM Ridgecrest and Barstow field offices.
BLM, California Desert District. WEMO Baseline comprehensive dataset for sightings of animal species with the West Mojave boundary (1956–2001).	Dataset of species observations provided by BLM.
BLM, California Desert District. WEMO 1998 Mohave ground squirrel transect	Dataset of Mohave ground squirrel transect results provided by BLM.
BLM, California Desert District. WEMO Location of bat roosts within the West Mojave Planning boundary (1978–1998).	Dataset of bat roost locations with species occurrence provided by BLM.
CDFG. CNDDB. November 1, 2011.	Dataset of species observations from the CNDDB.
CDFG. Mojave Ground Squirrel Positive Leitner Points Database.	Dataset of Mohave ground squirrel transect results provided by CDFG.

Data Layer	Metadata Description
CDFG. Trapping Grid Mojave Ground Squirrel Database. 2005.	Dataset of Mohave ground squirrel transect results provided by CDFG.
USFWS. Occurrence Information for Multiple Species within Jurisdiction of the Carlsbad Fish and Wildlife Office (CFWO): U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, Carlsbad, California, USA. January 25, 2011.	Dataset of species observations from the USFWS.
USFWS. Condor GPS Database. Unpublished. 2011.	Dataset of GPS transmitted data from the USFWS.
USFWS. Peninsular bighorn sheep GPS Database. Unpublished.	Dataset of GPS transmitted data from the USFWS.
USFWS. Peirson's milk-vetch Database.	Dataset of Peirson's milk-vetch occurrences from the USFWS.
Utah State. Flat-tailed horned lizard Database.	Dataset of flat-tailed horned lizard occurrences from Utah State.

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