



**Memorandum**

To: David Harlow, Director, Desert Renewable Energy Conservation Plan

From: Laura Crane, The Nature Conservancy

Date: January 31, 2013

Subject: Comments to the *"Description and Comparative Evaluation of Draft DRECP Alternatives"*  
Docket No. 09-RENEW EO-01

On behalf of The Nature Conservancy ("the Conservancy"), we are writing to provide comments to the *"Description and Comparative Evaluation of Draft DRECP Alternatives"* ("December Draft"). We thank you for the opportunity to review and comment on the December Draft prior to the release of the draft Desert Renewable Energy Conservation Plan ("DRECP") and associated environmental documents later this year. As a stakeholder in the DRECP process, our organization supports this critical plan and we thank you for the opportunity to review the documents and submit the attached response.

In addition to this individual comment letter, the Conservancy supports and is a signatory to the multi-environmental organization letter *"Essential Elements of a Successful Desert Renewable Energy Conservation Plan"* submitted on January 23, 2013. Furthermore, the Conservancy will be submitting a second comment letter before the end of February 2013 that will address specific subjects raised in the December Draft, including, but not limited to, mitigation, durability, the approach for designating NLCS lands, the pending project process, groundwater and Golden Eagle strategy. If you have any questions, please do not hesitate to contact me at (760) 365-5457 or [lcrane@tnc.org](mailto:lcrane@tnc.org).

We look forward to continuing to work collaboratively on the Desert Renewable Energy Conservation Plan.

Sincerely,

Laura Crane  
The Nature Conservancy

**Enclosed:** *Comments to the Description and Comparative Evaluation of Draft DRECP Alternatives*



## Comments to the *“Description and Comparative Evaluation of Draft DRECP Alternatives”*

### Introduction

The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends. The Conservancy is a stakeholder to the DRECP and we are committed to using our on-the-ground experience and our scientific expertise to strengthen the DRECP conservation planning process.

The DRECP is at a critical stage in the planning process and we are firmly committed to its successful completion. We believe that the concerns raised thus far are surmountable and that with corrections the DRECP will be able to achieve its renewable energy and conservation goals. With this in mind, in the following pages we recommend specific strategies that should be pursued prior to selection a preferred alternative for the DRECP.

**First**, we strongly recommend that the top priority be to complete development of the biological goals and objectives (BGOs). These BGOs should include plan-wide, regional, and sub-regional goals.

**Second**, after completion of the BGOs, we recommend that the REAT agencies run an analysis to determine if any of the proposed Development Focus Areas (DFAs) preclude the ability to achieve any of the BGOs, including sub-regional goals. If any DFAs preclude the ability to meet plan-wide or sub-regional goals, these DFAs must be modified so that the BGOs can be met with a reserve design.

**Third**, we recommend that the REAT agencies remove any Development Focus Areas proposed for the Amargosa Watershed (as defined within this comment letter) from consideration.

**Fourth**, we provide recommendations to strengthen development of the conservation planning process and continue to encourage the REAT agencies to improve the clarity and transparency of their methodology.

## DRECP Alternatives

The DRECP alternatives featured in the December Draft include a “preliminary analysis of the alternatives...for purposes of comparative evaluation.”<sup>1</sup> The draft does not contain a complete covered species list, or complete biological goals and objectives, nor does it evaluate how these biological goals and objectives could be met for each proposed Development Focus Area. Without this essential analysis, the Conservancy must recommend that the REAT agencies follow the precautionary principle (as advocated by the DRECP Science Advisory Panel), which mandates that proposed development be limited to the most degraded areas. As presented, none of the alternatives are configured to limit development to the most degraded areas; therefore we cannot support any of the alternatives listed at this time.

In our comments, we will provide specific recommendations related to the Development Focus Areas and the Conservation Planning Process that should be addressed prior to selection of a preferred alternative. Within Appendix A we provide recommendations for the Amargosa Watershed of the California Mojave Desert. Within Appendix B we provide an analysis specific to the undesignated “white areas” presented in the December Draft. Within Appendix C we provide detailed recommendations for the conservation reserve design. Within Appendix D we provide a preliminary assessment of potential impacts of the DRECP draft alternatives on biodiversity of the Mojave Desert.

### Recommendations: Development Focus Areas

1. **Development in the Amargosa Watershed.** We recommend that the REAT agencies remove any Development Focus Areas proposed for the Amargosa Watershed (as defined within Appendix A) from consideration. The Amargosa Watershed is an ecologically fragile groundwater-dependent system and home to a collection of listed, endemic, rare and sensitive species in California and Nevada. These species are groundwater dependent and development within this watershed presents a significant threat to their survival. Appendix A contains an analysis of proposed Development Focus Areas within the Amargosa Watershed.
2. **Development in the Tehachapi Region.** The Conservancy has been working in the Tehachapi Region for seven years, investing more than \$11.5 million to plan, acquire and manage nearly 32,000 acres of land. In our letter dated August 9, 2012, (pages 14-20) we provided information about the irreplaceable conservation values of the area and identified areas of concern. These areas still are contained within DFAs, in particular Alternatives 5 and 6, and we want to re-iterate our concern.

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<sup>1</sup> DRECP. *Frequently Asked Questions for the Description and Comparative Evaluation of Draft DRECP Alternatives*. January 2013.

3. **In lieu of recommending an Alternative**, which is premature at this time for the reasons noted above, the Conservancy recommends the REAT agencies use the following principles in the creation of DFAs and selection of a preferred alternative.
  - a. A DFA, or the suite of DFAs included in a given alternative, must not preclude the ability to meet biological goals and objectives, including regional and sub-regional goals. Any DFA that does not allow BGOs to be met must be reconfigured until the BGO(s) are achievable, and if that is not possible, the DFA must be eliminated from further consideration.
  - b. DFAs must work for renewable energy development and incorporate basic development criteria.
  - c. DFAs should be developed using the criteria outlined within the “*Renewable Siting Criteria for California Desert Conservation Area*” (June 2009). Development should be prioritized in areas with criteria identified as “Areas to Prioritize for Siting”. DFAs should avoid “High Conflict Areas” whenever possible.
  - d. DFAs should minimize the need for new transmission.
  - e. DFAs need meaningful incentives that will provide a real benefit to developing within their bounds.

## **Recommendations for the Conservation Planning Process**

The Nature Conservancy has developed and used science-based tools to achieve lasting conservation.<sup>2</sup> Landscape-scale ecological analysis is the operative heart of these tools. In our prior comments on the Initial Development Scenarios (May 2012), the Draft Conservation Planning Process (July 2012), and the Overview of DRECP Alternatives – Briefing Materials (August 2012), we stressed the importance of using landscape-scale ecological assessments, which include identifying conservation targets (conservation features) and defining biological goals and objectives, to plan land uses and make decisions about renewables project siting and mitigation. As the DRECP moves ever closer to making firm commitments on land use, it is even more essential that it adopt landscape-scale ecological assessments in energy siting and mitigation decision-making. With this in mind, we provide the following recommendations to strengthen the framework and execution of the DRECP’s conservation reserve design.

1. **The top priority should be to complete the Biological Goals and Objectives.** We are concerned that the Development Focus Areas have been delineated before the conservation analysis has been completed. In order to be successful, the DRECP must identify and clearly articulate the biological goals and objectives that the conservation plan seeks to accomplish. Broadly stated expressions of

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<sup>2</sup> For example, *Conservation by Design*, is used to identify the most important places for conservation, threats to the ecological health of those places, the best strategies to reduce those threats, and how to measure our effectiveness, via an eco-regional assessment process.

values may provide a sense of direction, but goals must be more precise, relating these values to a specific aspect of the conservation plan, and thereby connecting broad values to a desired tangible outcome. *Biological goals* provide descriptive guiding principles for conservation within the plan area that are based on the conservation needs of the covered species and natural communities. *Biological objectives* relate directly to goals, and are concise statements that provide quantitative, measurable targets and specify what and how much will be achieved, when and where it will be achieved, and who is responsible. The BGOs of the DRECP should include protection of the full spectrum of biological diversity present in the entire plan area and of the ecological and environmental (ecosystem) processes necessary to sustain native species, populations, and communities for the long term.

- 2. Development of the BGOs must include development of appropriate subregional goals.** The DRECP planning area is primarily comprised of two separate and distinct ecoregions (i.e., the Mojave Desert and the Sonoran Desert Ecoregions) and each of these regions are comprised of separate and distinct subregions (Appendix D, Figure D-1) with unique ecological meanings. Subregional goals and objectives are necessary to ensure the protection of ecologically, physiologically and genetically distinct populations of desert species, as well as regionally distinctive plant and animal communities and habitat types. In adherence to standards of ecoregional conservation reserve design, separate BGOs should be established for the portions of the Mojave Desert and Sonoran Desert Ecoregions that occur within the DRECP planning area. In addition, these two ecoregions should be further stratified (subdivided) into subregions based on significant variations across each ecoregion in vegetative, climatic (temperature and precipitation), and associated biotic features, and the BGOs crafted to capture this subregional variation in biological features across the DRECP planning area. With subregional variation in mind, the Conservancy has conducted a preliminary assessment of potential impacts of the DFAs within the Mojave Desert Ecoregion and its subregions (Appendix D). One of the main observations is that there is a disparity in the amount of development by region (for example, the Western Mojave subregion will have more development than the Northern Mojave subregion). While this is to be expected and we would not advocate for the subregions to have parity in terms of acres of development, this observation underscores the importance of stratification of biological goals and objectives into plan-wide goals, regional goals and subregional goals. Given subregional ecological variations and variations in proposed levels of development, assignment of subregional targets is appropriate in order to adequately protect and conserve the biodiversity of the planning area.
- 3. A Development Focus Area must not preclude the ability to achieve the biological goals and objectives set forth in the DRECP.** The REAT agencies should analyze the reserve design that has been proposed to verify that the BGOs can be met with the existing proposed DFAs and that the DFAs do not preclude achieving any of the BGOs. If the BGOs cannot be met, the Development

Focus Areas and reserve design should be refined until the goals are achievable by altering the configuration or the entire location of the DFAs to avoid any areas that are necessary for the reserve design to meet BGOs. This analysis should be shared with stakeholders prior to release of the draft DRECP and associated environmental documents. This analysis is not only critical for conservation stakeholders, but to other stakeholders in their analysis of if the plan can meet their individual needs (e.g., energy development, energy infrastructure development, counties). The analysis should be clearly defined and documented in the draft DRECP and EIR/EIS.

- 4. The current “Conservation Area Reserve System” is *\*not\** a Conservation Reserve Design. Instead, it is a characterization of conservation values across the desert.** A conservation reserve design must be based on biological goals and objectives and is a geographic representation of how to meet those goals.
- 5. We recommend that the agencies define a clear methodology used to develop a true Conservation Reserve Design.** We recommend that all subsequent documents clearly and prominently define the full suite of covered species and BGOs and the approach used to map and calculate acreages for the alternative-specific Conservation Area Reserve Systems. We also recommend that each term (e.g., Conservation Reserve Design, Conservation Area Reserve System, Desert Conservation Lands, and Conservation Planning Areas) be clearly defined and differences be explained.
- 6. We disagree with some of the areas the REAT agencies have characterized as “undesigned ‘white areas’” and request that these areas be re-characterized based on existing analyses.** In addition, we request that the methodology behind designating “undesigned ‘white areas’” be clearly articulated to stakeholders. The Conservancy compared existing ecological assessments that identified high value conservation lands in the California Desert to the “white areas” in the DFAs (Appendix B). The analysis identified a number of instances where the “white areas” within DFAs left undesignated in the December Draft with regard to their biological sensitivity have previously been identified as high value conservation lands by the Conservancy. These are “Ecologically Core” and “Ecologically Intact” lands that contain important conservation and connectivity values. Moving forward, and prior to making firm commitments about “undesigned ‘white areas’” (including Conservation and Management Actions, such as survey and mitigation requirements), we recommend that the REAT agencies: (1) complete the biological goals and objectives, (2) complete the conservation reserve design, (3) ensure that the Development Focus Areas do not preclude meeting BGOs by making any required revisions, and then (4) re- categorize the lands within the DFAs based on all existing information. If the REAT agencies have newer data that indicate that the “white area” designation is correct, we request that this information be shared with The Nature Conservancy. The areas of conflicting overlap are identified in Appendix B, Figures B-1 through B-6.

- 7. The Plan-wide Biological Reserve Design and alternative-specific Conservation Area Reserve Systems should incorporate the attached principles.** The Conservancy has developed and used science-based tools to achieve lasting conservation based on landscape-scale ecological analysis. As a stakeholder to the DRECP process, one of our priorities is to advise on development of a Plan-wide Biological Reserve Design and alternative-specific Conservation Area Reserve Systems that can meet regional conservation goals. With this in mind, we provide the attached recommendations (Appendix C) to strengthen the framework and approach.

## Appendix A: Recommendations for the Amargosa Watershed

For DRECP planning purposes, the Conservancy recommends using the “Death Valley Regional Ground Water Flow Model Boundary” (USGS) to delineate the Amargosa Watershed (Figure A-1).

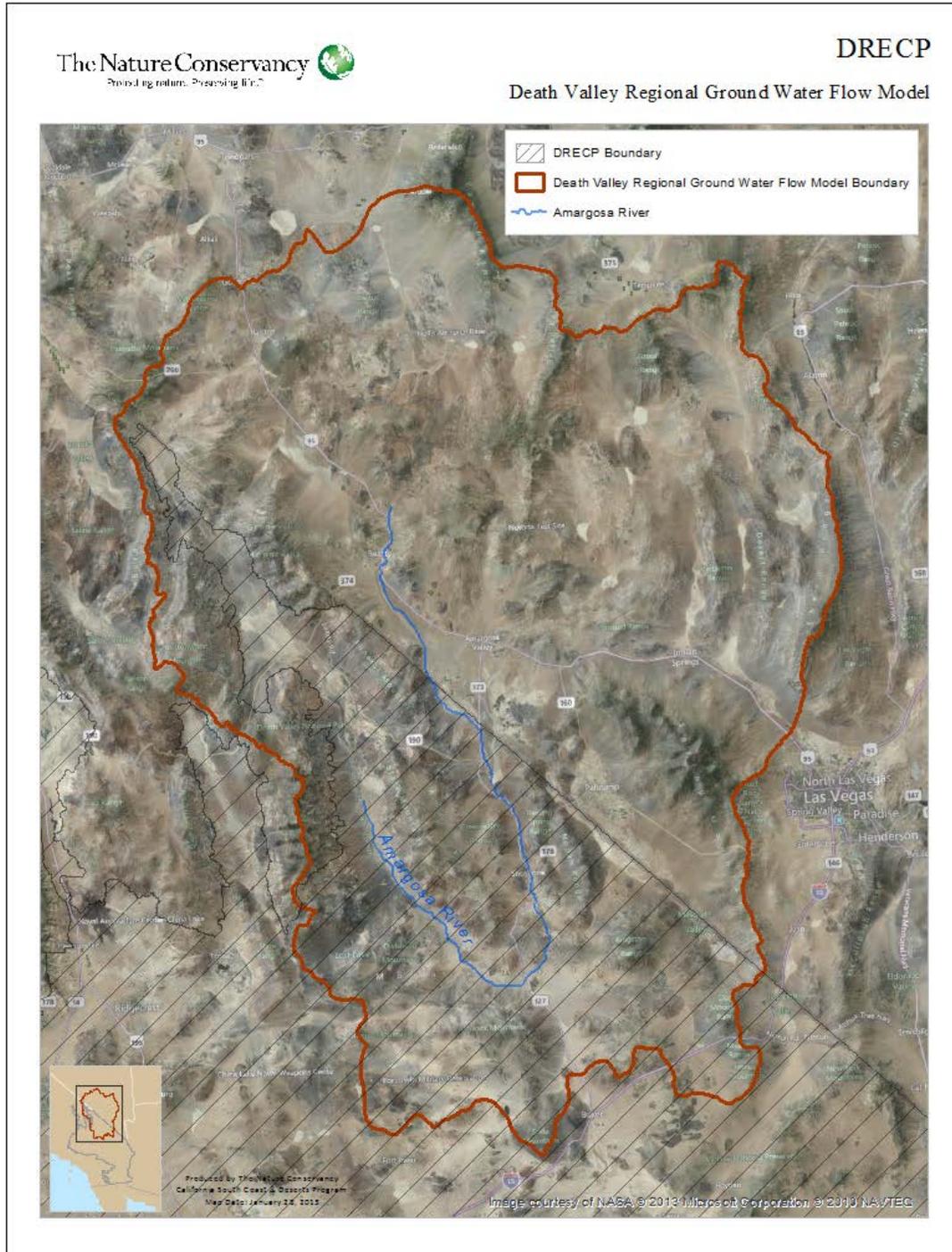
Desert groundwater is an exceedingly scarce, declining, and crucially important resource, often little understood – especially the subsurface hydrologic dynamics. Renewable energy pumping of groundwater is a new and likely permanent use of water; and the adverse effects of pumping on surface water-dependent resources are often distant from the source and delayed in time so that by the time such adverse effects are detected, it is too late to stop pumping in order to save these resources.

The groundwater-dependent Amargosa River system harbors a world-class collection of listed, endemic, rare and sensitive species in both California and Nevada. With partners, The Nature Conservancy has been engaged in the conservation of this ecologically fragile system for 40 years, spending more than \$8 million to plan, acquire and manage over 18,000 acres of lands, protect groundwater, and restore habitat in the Amargosa Basin. The Conservancy has done extensive conservation analysis and planning for the Amargosa that reveals the unique importance of the aquatic and riparian resources of this area. Recent federal action has confirmed our analyses: in 2009, reaches of the Amargosa River in California were added to the national Wild and Scenic River system. The sources and paths of the groundwater that supplies the springs and river across the 3.4 million acre Amargosa River watershed have been little studied. However, groundwater levels have been steadily dropping in many areas of the region, due in part to existing groundwater pumping from over appropriated aquifers in Nevada. Maintaining and protecting the perennial flow of springs – and the groundwater aquifers that supply them with water – is **the single most important action** that must be taken to keep this desert system, and the special status species that inhabit it, viable for the long term.

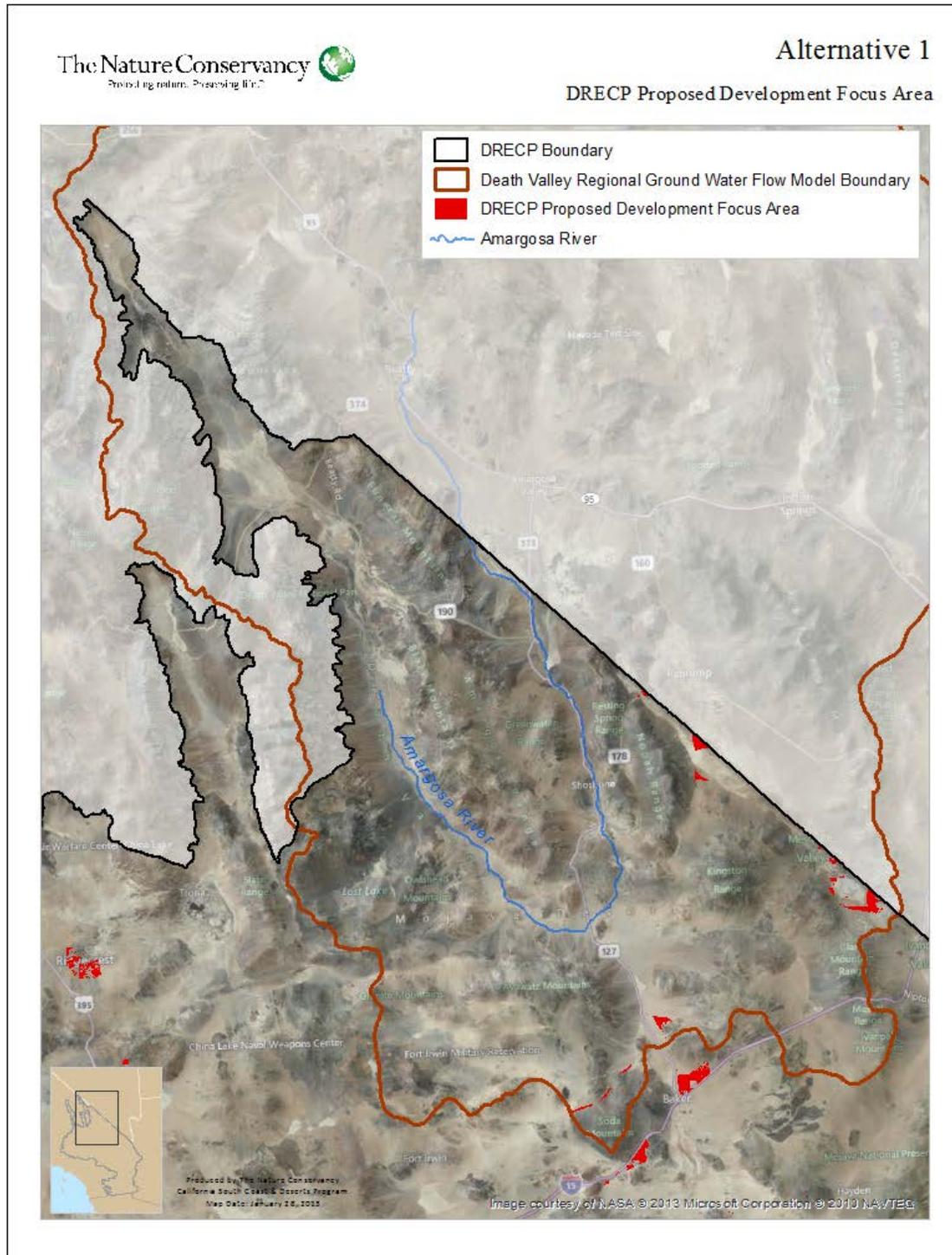
For these reasons, the Conservancy is concerned by the cumulative effects of groundwater pumping by proposed renewable energy facilities within both the California and Nevada region of the Amargosa Watershed. Renewable facilities located in the Amargosa basin in Nevada will pump groundwater from an already over-drafted and over-appropriated bi-state aquifer system that is linked to the Wild and Scenic Amargosa River and its vital springs, seeps and wetlands in California. Understandably, the DRECP does not include Nevada facilities as they are outside of the Planning Area. However, given the ecological fragility of the Amargosa Watershed as a whole, and well-documented hydrological connection between the Nevada and California portions of the Watershed, these cumulative effects should not be overlooked, and further development within the California section of the Amargosa basin should be precluded.

**Specifically, the proposed Development Focus Areas within the Amargosa Watershed should be removed due to the serious threat that development poses to protected groundwater-dependent species.** As currently designed, Alternative 1 (Figure A-2), Alternative 2 (Figure A-3), Alternative 5 (Figure A-4) and Alternative 6 (Figure A-5) all include Development Focus Areas within the Amargosa Watershed.

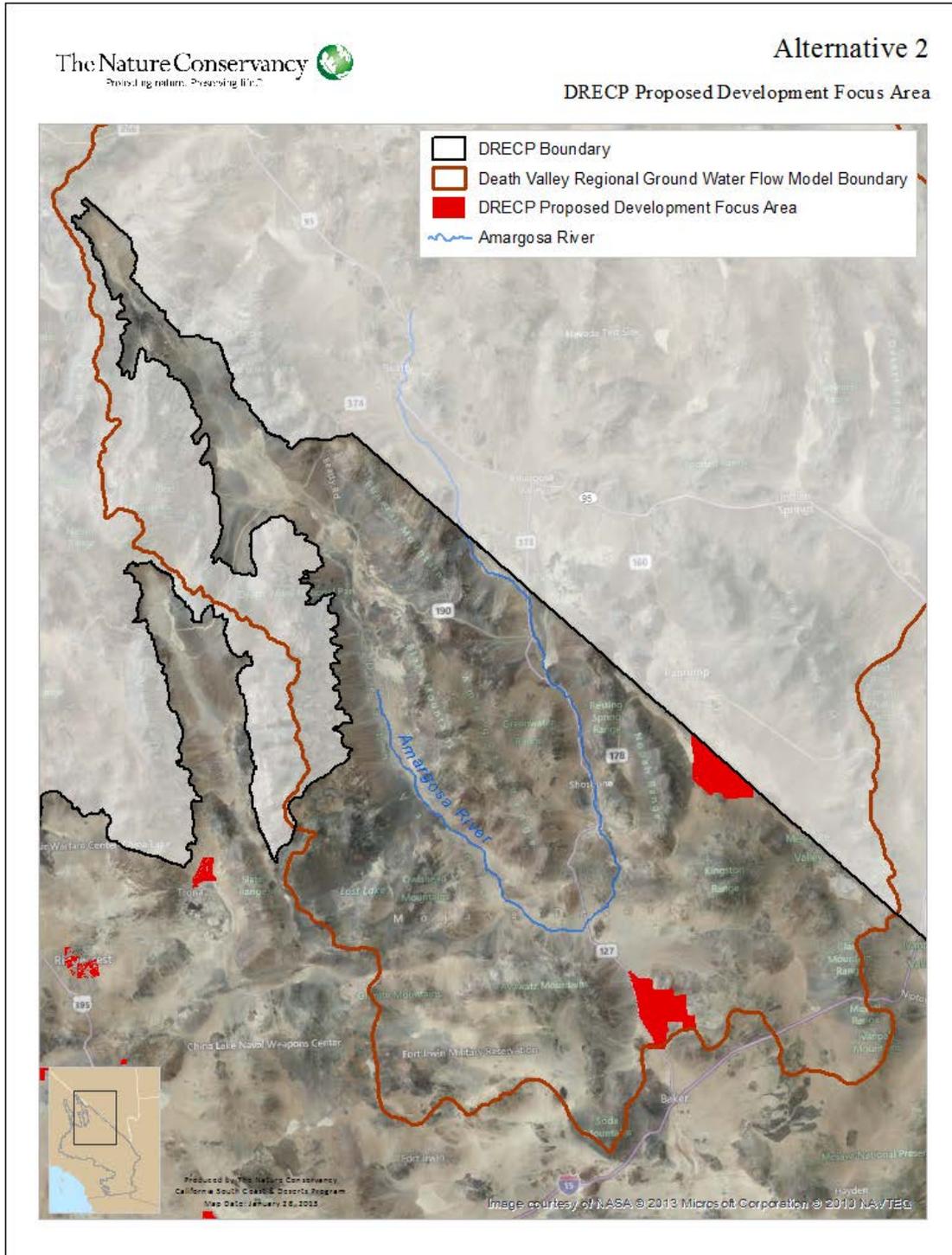
Figure A-1: DRECP and Death Valley Regional Ground Water Flow Model Boundary



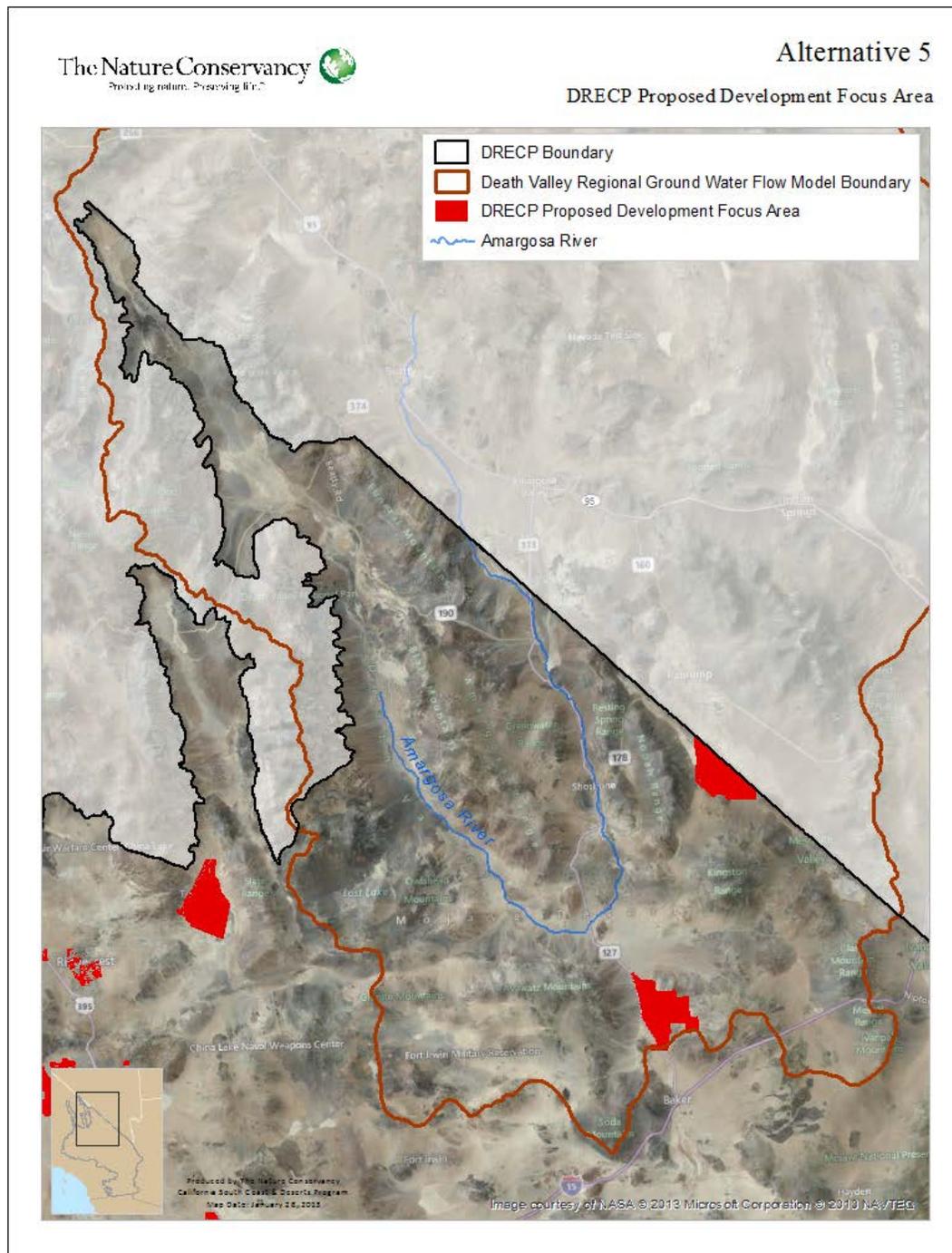
**Figure A-2:** DRECP Alternative 1 – Development Focus Areas that should be removed from within the Amargosa Watershed.



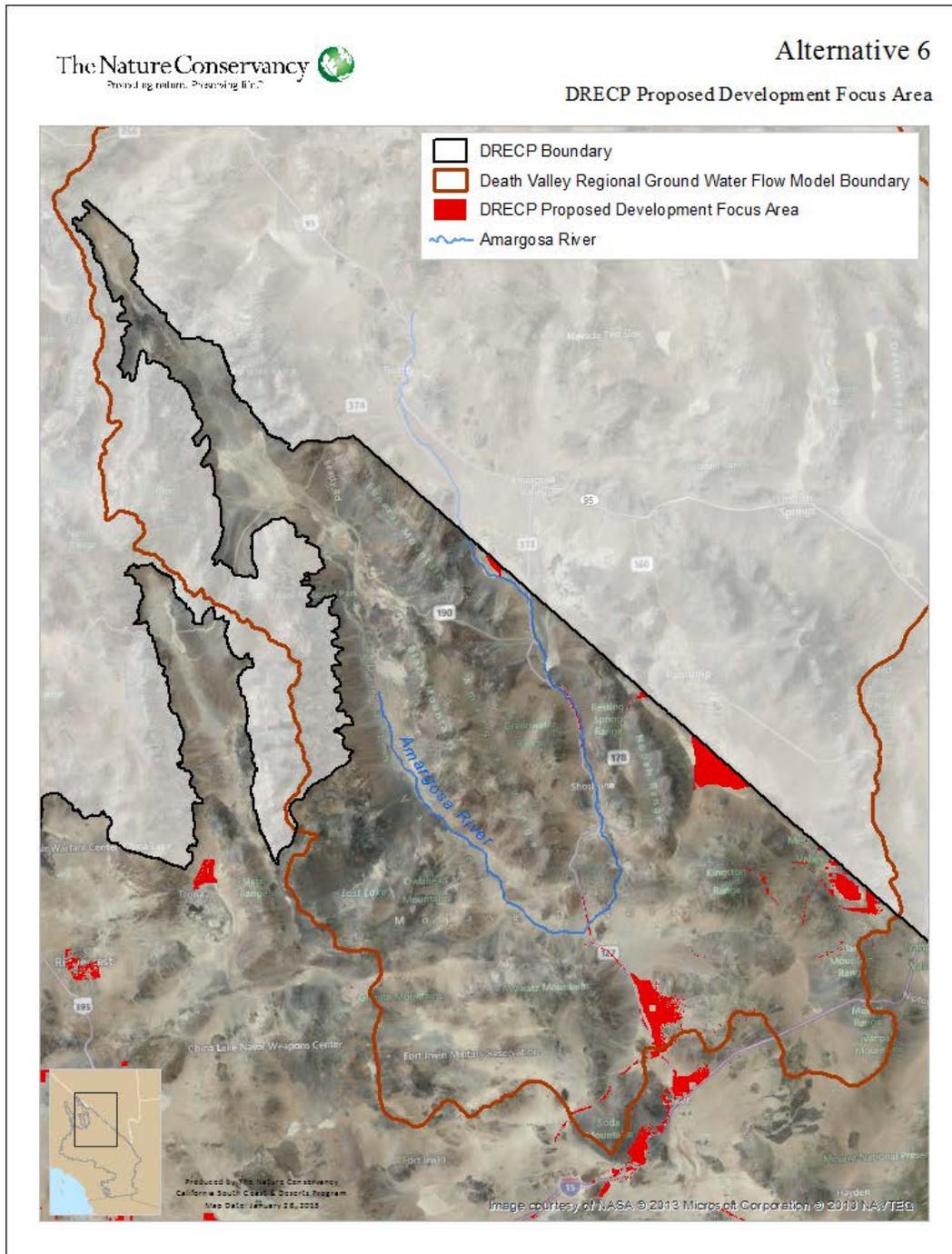
**Figure A-3:** DRECP Alternative 2 – Development Focus Areas that should be removed from within the Amargosa Watershed



**Figure A-4:** DRECP Alternative 5 – Development Focus Areas that should be removed from within the Amargosa Watershed.



**Figure A-5:** DRECP Alternative 6 – Development Focus Areas that should be removed from within the Amargosa Watershed.



### Development Conditions within the Amargosa Watershed:

As noted above, the Conservancy strongly recommends that development be precluded within the ecologically fragile Amargosa Watershed. However, if the REAT agencies move forward with a preferred alternative that includes DFAs within the Amargosa, the Conservancy strongly urges that the following actions are taken.

1. Expand the covered species and biological goals and objectives to include the features in Table A-1. The Amargosa River Watershed contains a broad suite of natural communities, ecological features, and species that are priorities for conservation. The features in Table A-1 were identified as high priority natural communities and species using The Nature Conservancy's planning process. Many of the features listed here are wetland habitats and associated species that are groundwater dependent.
2. Establish strong rule sets related to groundwater use within the Amargosa Watershed with protective provisions to ensure that development does not preclude conservation and recovery of these groundwater-dependent species. The Conservancy will submit detailed recommendations related to groundwater use, management and mitigation in our February 2013 comment letter.

**Table A-1:** Species, natural communities and other features of the Amargosa that should be added to the DRECP to ensure that development within the Amargosa Watershed does not preclude conservation and recovery.

Natural Community and Other Features	Species
1. alkali meadow/seep	1. Amargosa Canyon speckled dace
2. arroyo willow temporarily flooded cold-deciduous woodland	2. Amargosa niterwort
3. bat foraging habitat	3. Amargosa pupfish
4. big sagebrush- spiny hopsage scrub	4. Amargosa vole
5. black brush scrub- mixed scrub	5. American badger
6. black willow woodland	6. banded gila monster
7. blackbrush scrub- mixed scrub	7. Brown-crested Flycatcher
8. creosote bush mixed scrub	8. California myotis
9. fourwing saltbush- winterfat scrub	9. Crissal Thrasher
10. interior riparian forest and woodland	10. Death Valley beardtongue
11. Joshua tree woodland	11. egg milkvetch
12. juniper woodland	12. fringed myotis
13. limestone substrates	13. greater western mastiff bat

14. mesquite bosque	14. ivory-spined agave
15. Mojave mixed wood scrub	15. Kingston Mountain mousetail
16. perennial stream	16. Kingston Mountains bedstraw
17. phragmites semipermanently flooded herbaceous alliance	17. Lucy's Warbler
18. pinyon-juniper woodland	18. Moapa naucorid
19. playa	19. Nevada speckled dace
20. sagebrush semi-desert	20. New York Mountain cryptantha
21. saltbush scrub	21. nolina
22. shadscale scrub	22. Pacific chorus frog
23. springs	23. Pahute Mesa beardtongue
24. stabilized and partially stabilized desert dunes	24. Panamint Mountain lupine
	25. Phainopepla
	26. sand linanthus
	27. Saratoga Springs pupfish
	28. Shoshone cave whip-scorpion
	29. Shoshone pupfish
	30. Stephens's beardtongue
	31. Summer Tanager
	32. Tecopa bird's beak
	33. Tecopa pupfish
	34. Vermillion Flycatcher
	35. Western Yellow-billed Cuckoo
	36. white fir

## Appendix B:

### Ecological Analysis of the Undesignated “White Areas” Presented in the *Description and Comparative Evaluation of Draft DRECP Alternatives*

#### Methods

The DRECP has used a Biological Sensitivity assessment to categorize lands into three categories: (1) “blue” areas of high biological sensitivity, (2) “green” areas of moderate biological sensitivity, and (3) undesignated “white” areas considered to be the least valuable for long-term species conservation. To evaluate how each of the six DRECP development alternatives would impact the conservation value of the California deserts, we identified the conservation value of lands as designated in The Nature Conservancy’s 2010 Mojave Desert Ecoregional Assessment (MDEA)<sup>3</sup> or the 2009 Sonoran Desert Assessment<sup>4</sup> that overlapped with the undesignated “white” areas considered by the DRECP to be the least valuable for long-term species conservation. This was done for each of the six DRECP draft alternatives. The conservation value of lands categorized in the MDEA is roughly equivalent to the conservation value of lands as categorized in the Sonoran Desert Assessment, allowing for an analysis of all desert DRECP lands in California.

#### Results

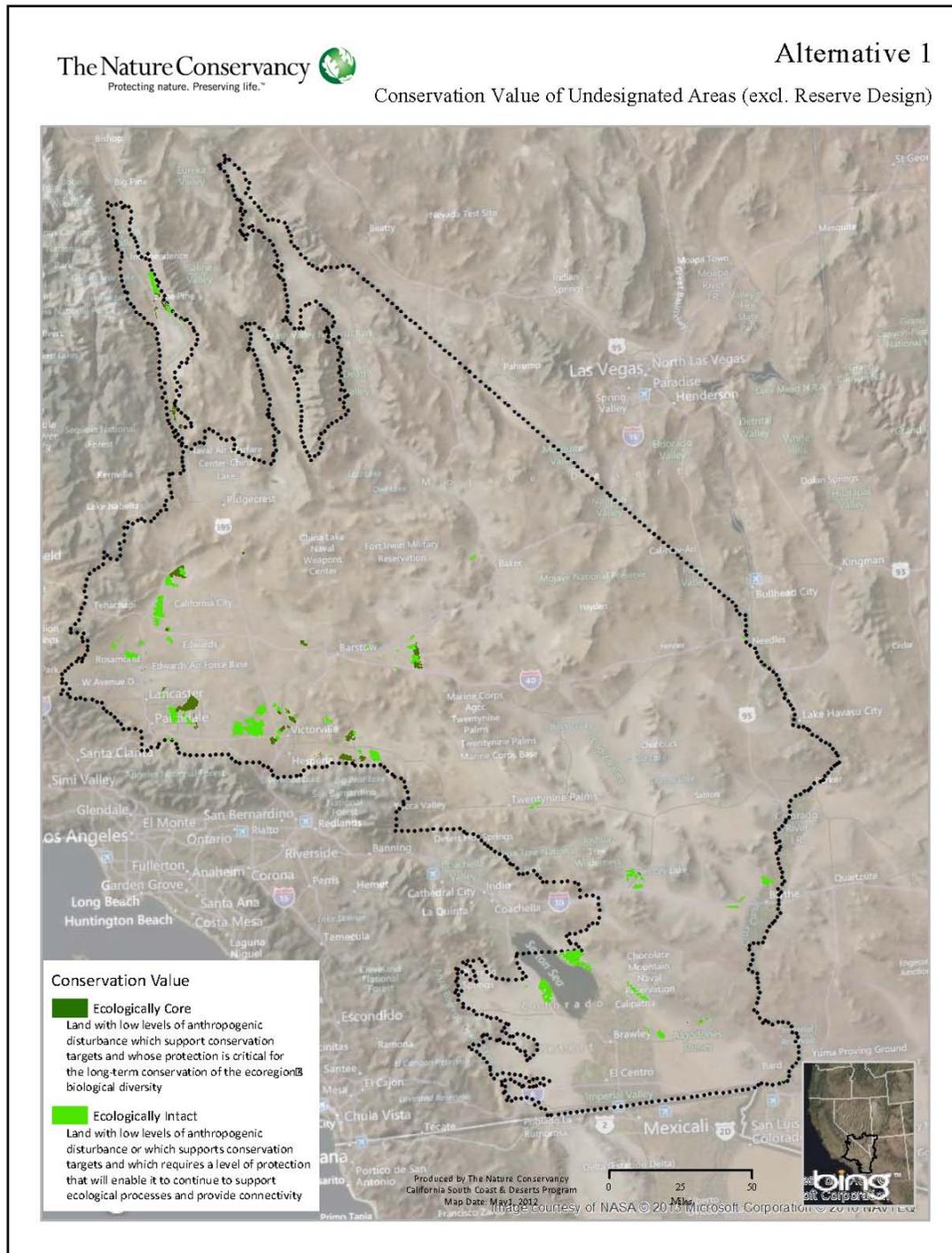
The impacts of development of DFAs would vary from one alternative to the next, but for each alternative there are a number of instances where the “white” lands within DFAs left undesignated by the DRECP with regard to their biological sensitivity have previously been identified as high value conservation lands by the Conservancy. These are “Ecologically Core” and “Ecologically Intact” lands that have important conservation values for biological diversity and connectivity. In general, these lands are clustered in several locations, namely: the West Mojave subregion, around the Salton Sea, along the I-10 corridor, in the area east of Barstow, and within the Owens Valley. However, these high value lands that have been characterized by the DRECP as undesignated “white” areas occur in a number of other locations as well, depending on the development alternative (see Figures B-1-B-6). Alternative 6 has the greatest amount of these high value “white” lands (over 130,000 acres in the Western Mojave subregion alone), and the greatest amount of the highest value “Ecologically Core” land that has been left undesignated by the DRECP.

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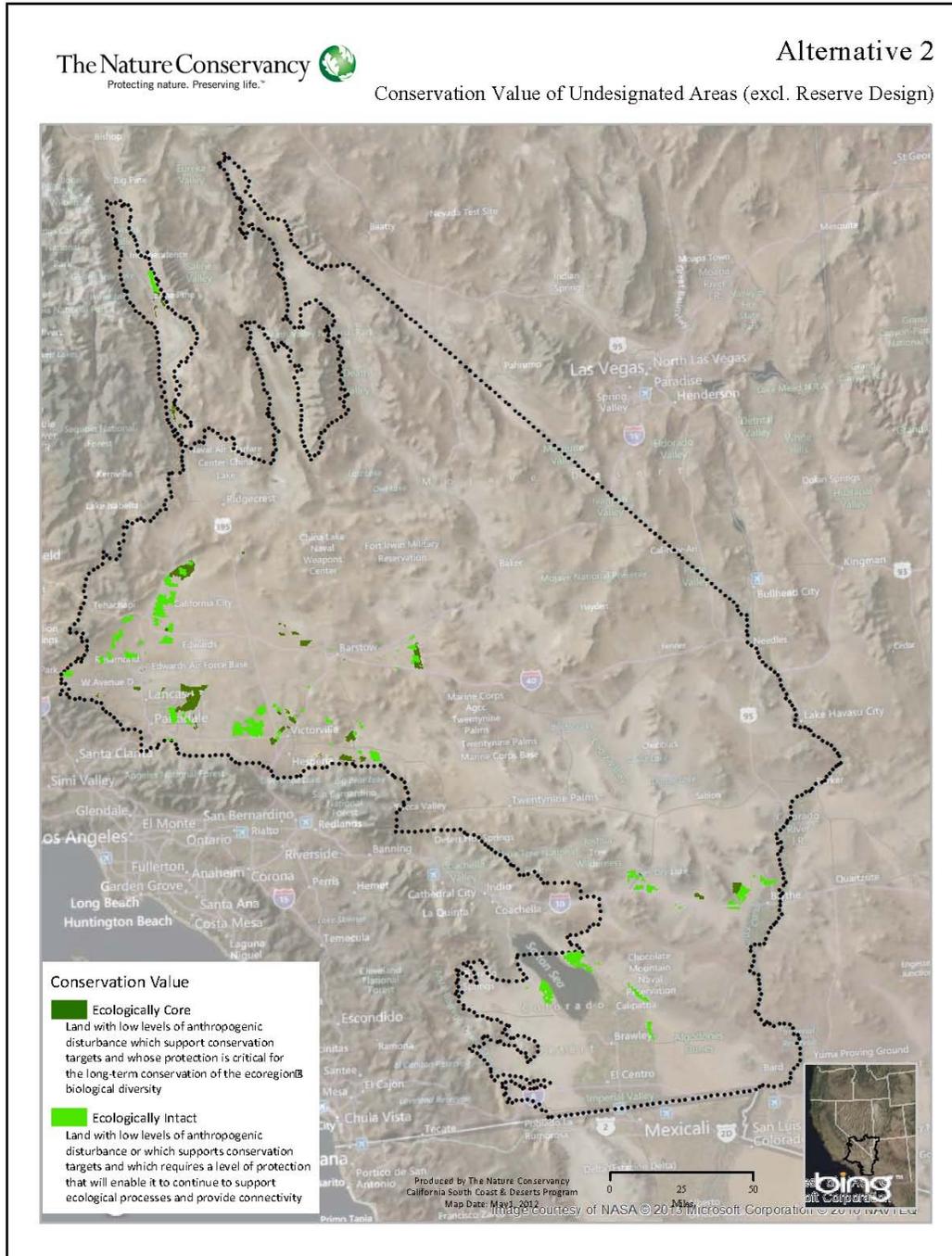
<sup>3</sup> Randall, J. M., S.S. Parker, J. Moore, B. Cohen, L. Crane, B. Christian, D. Cameron, J. MacKenzie, K. Klausmeyer and S. Morrison. 2010. Mojave Desert Ecoregional Assessment. Unpublished Report. The Nature Conservancy, San Francisco, California. 106 pages + appendices. Available at: <http://conserveonline.org/workspaces/mojave/documents/mojave-desert-ecoregional-2010/@@view.html>

<sup>4</sup> Conservation Biology Institute. 2009. A framework for effective conservation management of the Sonoran Desert of California. Prepared for The Nature Conservancy.

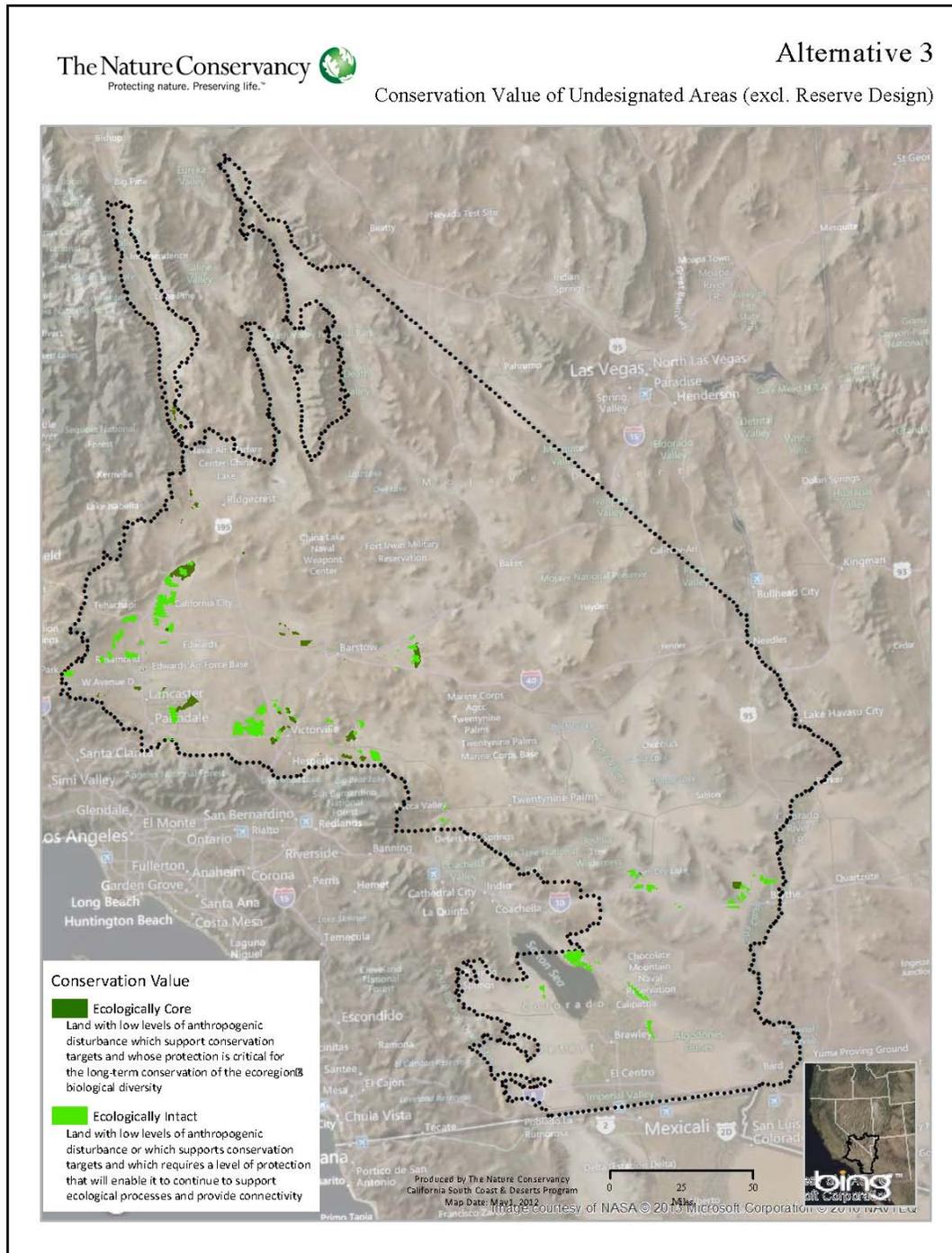
**Figure B-1:** Conservation Value (according to The Nature Conservancy's 2010 Ecoregional Assessment and the 2009 Sonoran Desert Framework) of DRECP Undesignated Lands found within the draft DRECP Development Focus Areas for Alternative 1 from December 17, 2012.



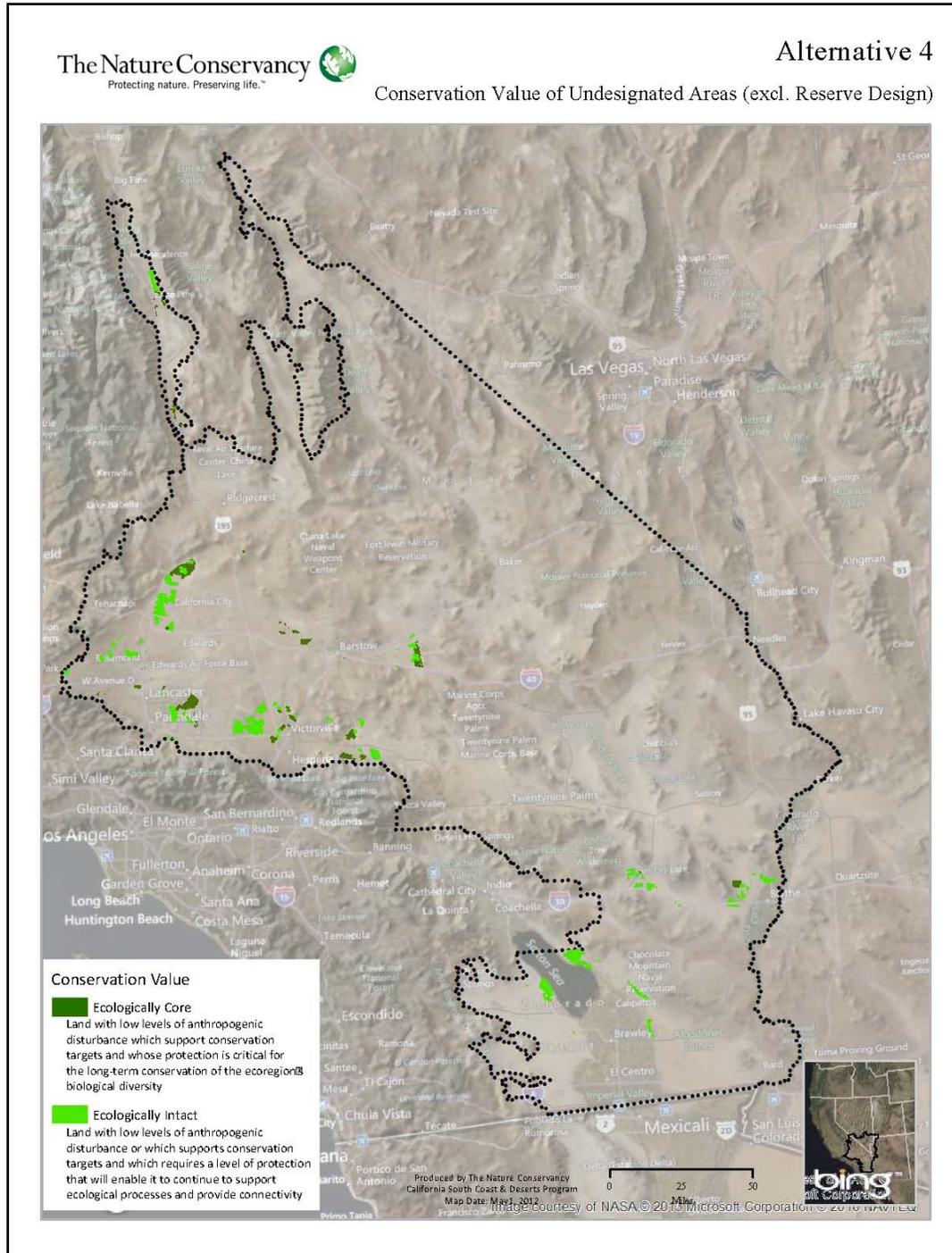
**Figure B-2:** Conservation Value (according to The Nature Conservancy's 2010 Ecoregional Assessment and the 2009 Sonoran Desert Framework) of DRECP Undesignated Lands found within the draft DRECP Development Focus Areas for Alternative 2 from December 17, 2012.



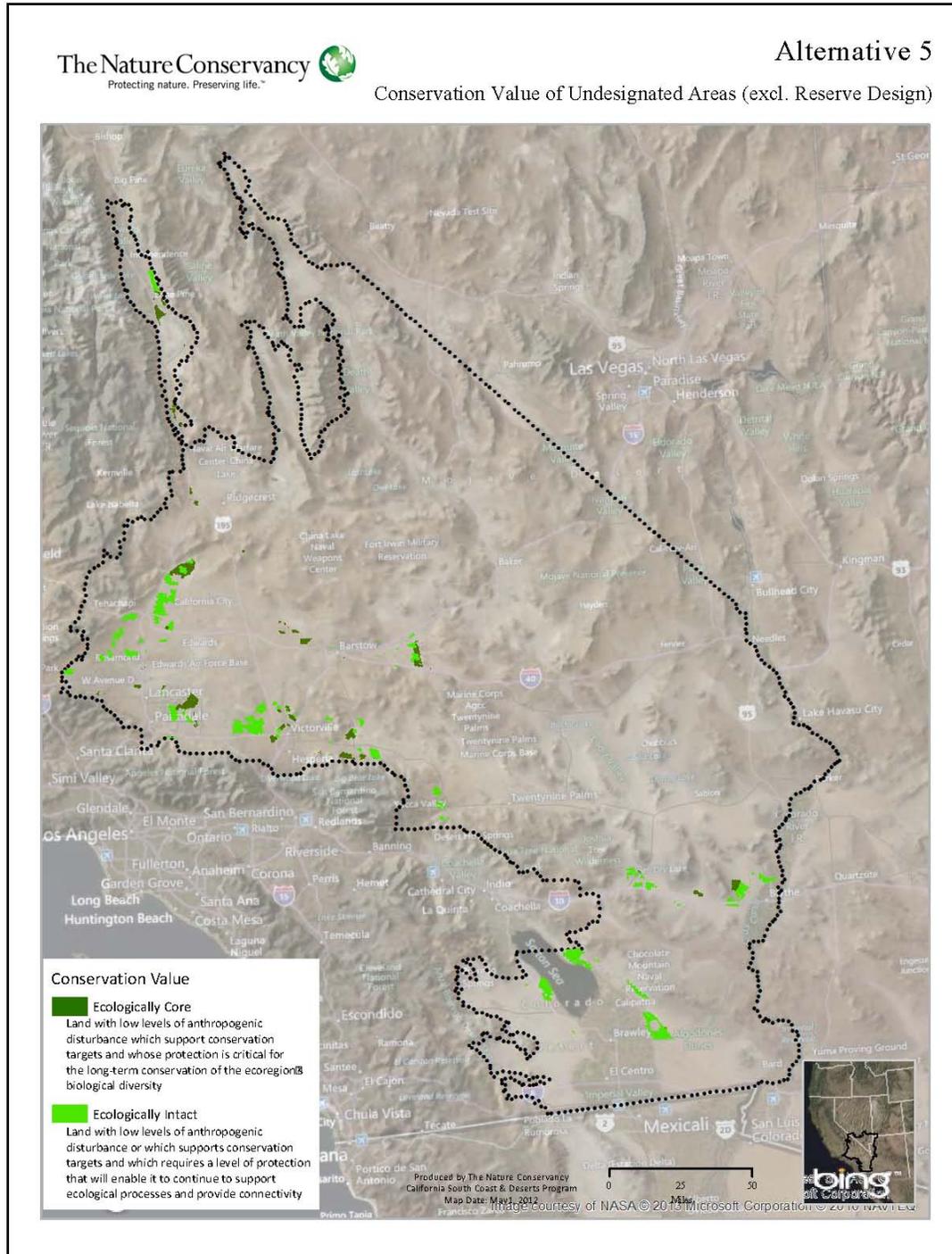
**Figure B-3:** Conservation Value (according to The Nature Conservancy's 2010 Ecoregional Assessment and the 2009 Sonoran Desert Framework) of DRECP Undesignated Lands found within the draft DRECP Development Focus Areas for Alternative 3 from December 17, 2012.



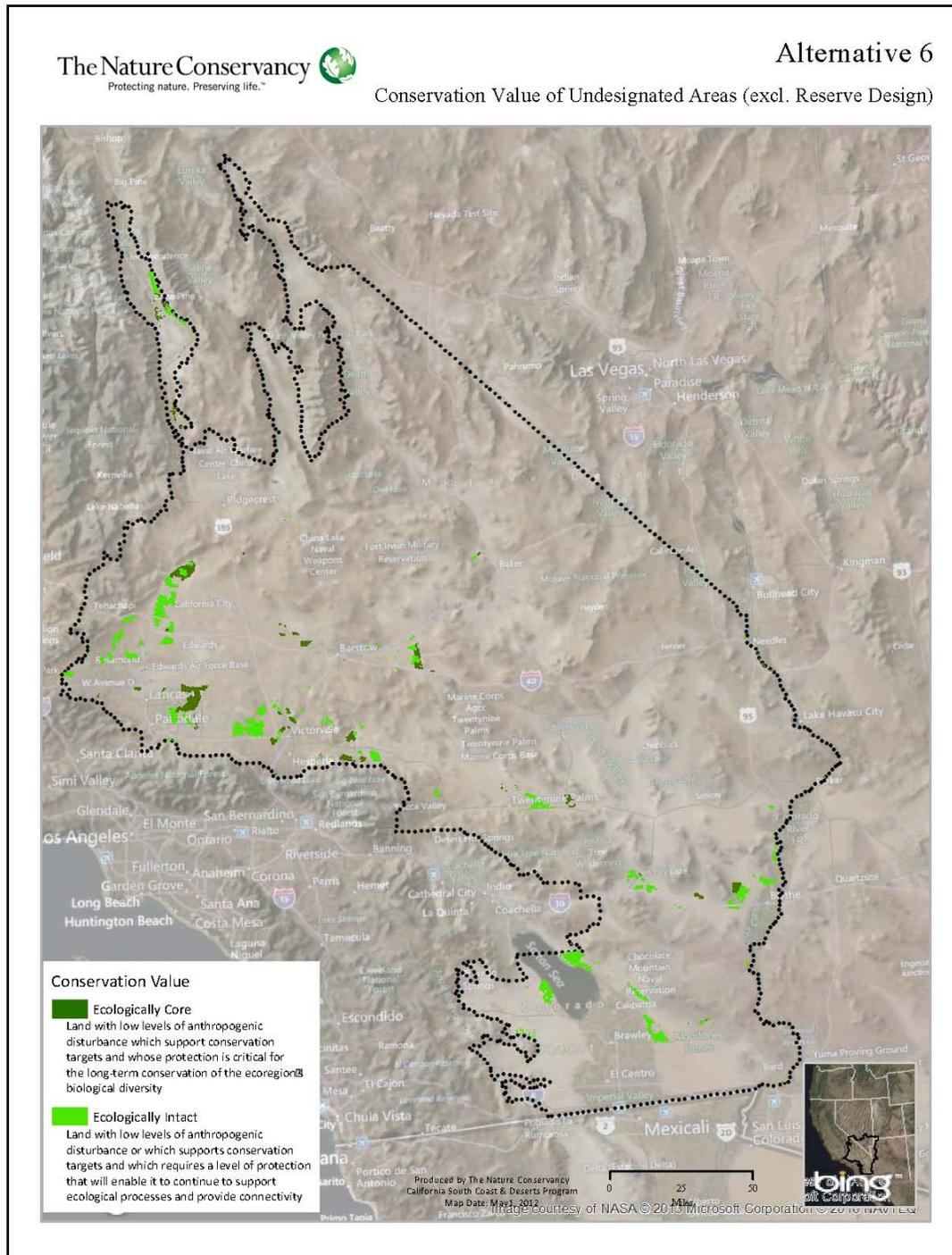
**Figure B-4:** Conservation Value (according to The Nature Conservancy's 2010 Ecoregional Assessment and the 2009 Sonoran Desert Framework) of DRECP Undesignated Lands found within the draft DRECP Development Focus Areas for Alternative 4 from December 17, 2012.



**Figure B-5:** Conservation Value (according to The Nature Conservancy's 2010 Ecoregional Assessment and the 2009 Sonoran Desert Framework) of DRECP Undesignated Lands found within the draft DRECP Development Focus Areas for Alternative 5 from December 17, 2012.



**Figure B-6:** Conservation Value (according to The Nature Conservancy's 2010 Ecoregional Assessment and the 2009 Sonoran Desert Framework) of DRECP Undesignated Lands found within the draft DRECP Development Focus Areas for Alternative 6 from December 17, 2012.



## Appendix C: Conservation Reserve Design Principles

The Nature Conservancy recommends that the DRECP incorporate the following principles into their planning process for the Plan-wide wide Biological Reserve Design and alternative-specific Conservation Area Reserve Systems.

1. The goals of the Conservation Reserve Design or reserve network design should include protection of the full spectrum of biological diversity present in the entire plan area and of the ecological and environmental (ecosystem) processes necessary to sustain native species, populations, and communities for the long term. The plan must identify and clearly articulate the covered species and other features as well as the conservation and other goals the reserve design seeks to accomplish.
2. The goals should include the protection of populations of endangered, threatened, and rare species that contain the full breadth of their genetic diversity. It should also include the protection of other target species selected because of their vulnerability to known threats present or projected for the California deserts or because they can serve as umbrella species for the protection of suites of other species, communities, and ecosystem processes.
3. The goals should include the protection of communities that serve as habitat for many of the more common species in the California deserts, as well as some of the rare and target species.
4. The goals should also include the protection of all important ecosystem processes, such as hydrology, pollinator relationships, seed dispersal, etc.
5. The plan should be representative, complimentary, and redundant:
  - a. It should provide for the protection of all species, populations, genotypes, communities and ecosystems that represent the biodiversity of California's Deserts (and the area of the Tehachapi Range included in the DRECP area).
  - b. It should include a suite of protected areas that complement one another in terms of the species, communities, linkages and genetic variety they protect.
  - c. It should protect multiple examples of each target to help ensure that none are wiped out by a single major disturbance event such as a wildfire, flash flood, or landslide.
6. Where all other factors are equal, large, unfragmented blocks of land (reserve units) are better than smaller blocks.
7. Lands and waters included in the reserve network design should contain a diverse representation of physical and environmental conditions present across the California deserts.
8. Reserve lands should be contiguous or at least connected by linkages wherever and whenever possible. This will allow plants and animals to move to new areas over short and long timespans as needed to adjust to relatively short-term weather conditions such as droughts or floods, dearth of prey or abundance of forage, and to adjust to longer-term and more permanent changes in climate and other environmental parameters.
  - a. Where it is not possible to link blocks of land with protected corridors, buffer-lands that are permeable to the movement of target plants and animals should be identified and given adequate protection to ensure they will remain permeable.

## **Appendix D:**

# **Preliminary Assessment of Potential Impacts of DRECP Draft Alternatives on Biodiversity of the Mojave Desert**

### **Overview**

- This analysis takes an ecoregional approach, using The Nature Conservancy’s 2010 Mojave Desert Ecoregional Assessment, to review the potential impacts of the six DRECP draft alternatives on biodiversity of the Mojave Desert of California.
- The results of this analysis indicate that:
  - While some of the DRECP draft alternatives place more land in Development Focus Areas than others, all alternatives designate comparable amounts of Conservation Area Reserve System lands (Tables D-1 and D-2).
  - While some alternatives have a higher percentage of high value (Ecologically Core or Ecologically Intact) conservation lands within their Development Focus Areas, all alternatives have similar percentages of high value conservation lands in their Conservation Area Reserve System (see Figures D-2 and D-3).
  - There are several instances where the majority of a subregion’s Development Focus Area lands for a particular alternative are categorized as either Ecologically Core or Ecologically Intact (Table D-3).
  - For all six alternatives, the majority of DFA lands (60-77%) occur in the Western Mojave subregion.
  - The Eastern, Northern and South-Eastern subregions of the Mojave Desert of California contain Development Focus Area lands with a high percentage of their area designated as “Highly Biologically Sensitive” or “Moderately Biologically Sensitive” by the DRECP (Table D-4).

### **Introduction**

On December 17, 2012, the Desert Renewable Energy Conservation Plan (DRECP) released seven draft alternatives, including a “no-option” alternative, number seven. Each of the first six alternatives lays out Development Focus Areas (DFAs) and a Conservation Area Reserve System (CARS) for the California deserts. Here, we evaluate potential ecological impacts posed by development of DFAs, and analyze the conservation value of lands within the CARS for each of the first six alternatives. Our analysis is based on results from The Nature Conservancy’s 2010 Mojave Desert Ecoregional Assessment<sup>5</sup> (MDEA). As such, we evaluate only those lands and potential impacts within the Mojave Desert Ecoregion, and not those within the Sonoran/Colorado Desert. This method corresponds with The Nature Conservancy’s science-based, landscape-scale approach to

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<sup>5</sup> Randall, J. M., S.S. Parker, J. Moore, B. Cohen, L. Crane, B. Christian, D. Cameron, J. MacKenzie, K. Klausmeyer and S. Morrison. 2010. Mojave Desert Ecoregional Assessment. Unpublished Report. The Nature Conservancy, San Francisco, California. 106 pages + appendices. Available at: <http://conserveonline.org/workspaces/mojave/documents/mojave-desert-ecoregional-2010/@@view.html>

conservation planning. Our analysis provides information about the potential impacts to biodiversity of the Mojave Desert in California posed by the possibility of full development of the DFAs under the six DRECP draft alternatives. It also provides information about the conservation value of CARS lands under each of the six draft alternatives.

## **Methods**

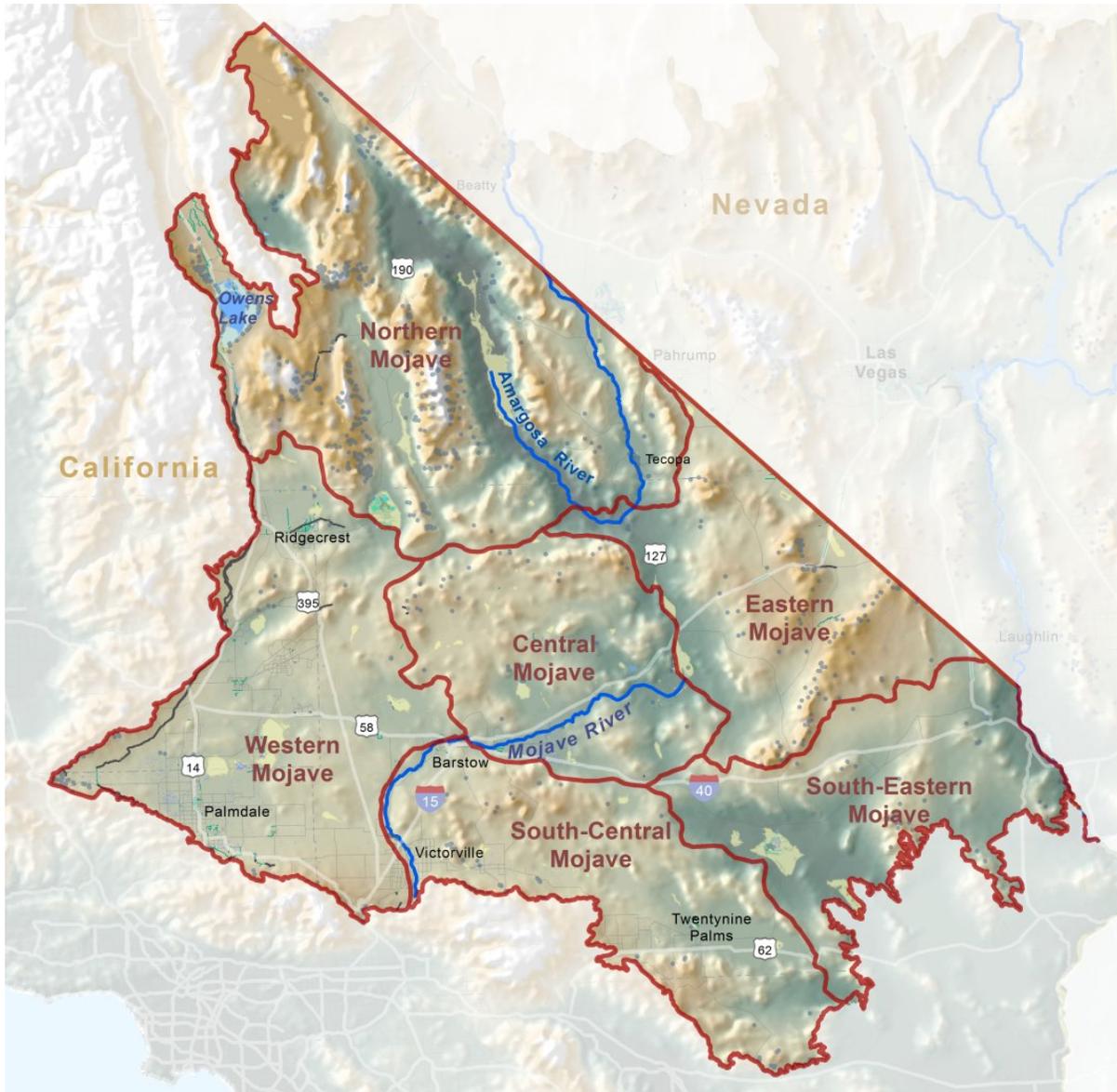
The Mojave Desert Ecoregional Assessment (2010) sought to identify a portfolio of lands that would best contribute to the conservation of the native biodiversity representative of the Mojave Desert. The conservation targets of the assessment, for which quantitative representation goals were set, included 521 species (122 animals and 399 plants), 44 ecological systems, and all known seeps and springs. The conservation targets from the MDEA will hereafter be referred to as “features”, to correspond with DRECP terminology.

The MDEA dataset represents the most comprehensive and current characterization of biodiversity and conservation values of the desert, based on quantitative goal statements for each of the conservation features in the plan (see Table A-3 of the MDEA). The MDEA was conducted using contiguous hexagonal planning units, each approximately one square mile in area. The Ecological Systems and species present vary across the Mojave Desert, so for the purposes of the conservation analysis the ecoregion was divided into subregions, delineated based on both the ecological genetics of the desert tortoise and on watershed boundaries. The subregions of the Mojave Desert that are found within the state of California are shown in Figure D-1. In California, the Mojave Desert covers approximately 18,000,000 acres, about 17% of the land area of the state.

The distribution of conservation values in the Mojave Desert was characterized in the MDEA using a four-category scheme that classifies all areas of the ecoregion as Ecologically Core (greatest conservation value for achieving the ecological goals set in the assessment), Ecologically Intact, Moderately Degraded, or Highly Converted (lowest conservation value) (see Table 1-1 and Appendix A of the MDEA for more detail). Marxan conservation planning software was used to help inform that classification and map the relative conservation value of lands across the Mojave Desert ecoregion for meeting conservation goals.

To evaluate how each of the six DRECP development alternatives would impact the conservation value of the Mojave Desert in California, we identified the conservation value of planning units (as designated in the MDEA) that overlapped with the DFA and CARS for each of the six DRECP draft alternatives.

**Figure D-1: Subregions of the Mojave Desert in California**



## Results

The impacts of development of DFAs in the Mojave Desert in California would vary from one alternative to the next. This is because the total acreage and the value of lands contained within the DFAs differ considerably among the six alternatives (Tables D-1 and D-2). CARS acreages and ecological values, however, are relatively consistent across the six alternatives. The tables immediately following present overall acreages and percentages for DFAs and CARS under each of the six proposed alternatives using the Conservancy's four evaluative categories.

**Table D-1:** Acres of land in the Mojave Desert of California by conservation value category as covered by the six draft DRECP *Development Focus Area* alternatives from December 17, 2012. The percentages reflect the percent by area of each of the four land categories found within the DFA for each alternative.

DRECP Draft Alternative	Acres in <i>Development Focus Area</i> by Category				Total Acreage in DFA
	TNC Ecologically Core	TNC Ecologically Intact	TNC Moderately Degraded	TNC Highly Converted	
Alternative 1	70,787 (11%)	103,388 (16%)	304,020 (47%)	165,838 (26%)	644,033
Alternative 2	101,958 (10%)	220,706 (21%)	475,401 (45%)	253,397 (24%)	1,051,463
Alternative 3	191,435 (16%)	242,313 (20%)	499,950 (42%)	253,021 (21%)	1,186,719
Alternative 4	73,730 (9%)	127,628 (15%)	382,218 (46%)	250,798 (30%)	834,375
Alternative 5	154,291 (14%)	243,653 (21%)	464,510 (41%)	271,127 (24%)	1,133,581
Alternative 6	176,506 (15%)	261,609 (22%)	504,125 (42%)	253,886 (21%)	1,196,126

**Table D-2:** Acres of land in the Mojave Desert of California by conservation value category as covered by the six draft DRECP *Conservation Area Reserve System* alternatives from December 17, 2012

DRECP Draft Alternative	Acres in <i>Conservation Area Reserve System</i> by Category				Total Acreage in CARS
	TNC Ecologically Core	TNC Ecologically Intact	TNC Moderately Degraded	TNC Highly Converted	
Alternative 1	2,028,794 (37%)	2,472,252 (45%)	922,927 (17%)	128,288 (2%)	5,552,261
Alternative 2	2,006,536 (38%)	2,374,861 (45%)	848,507 (16%)	100,361 (2%)	5,330,265
Alternative 3	1,906,847 (37%)	2,350,559 (45%)	820,158 (16%)	100,712 (2%)	5,178,276
Alternative 4	2,023,412 (37%)	2,457,913 (45%)	902,211 (16%)	99,982 (2%)	5,483,518
Alternative 5	1,956,508 (37%)	2,358,608 (45%)	860,730 (16%)	84,497 (2%)	5,260,343
Alternative 6	1,937,861 (37%)	2,343,121 (45%)	830,559 (16%)	101,069 (2%)	5,212,611

Thus, in the Mojave Desert of California, land total acreage of the DFA's range from 644,033 acres in Alternative 1 to 1,196,126 acres in Alternative 6, varying by a factor of nearly 1.9. Acreage of the DFAs categorized as Ecologically Core ranged from 70,787 acres in Alternative 1 to 191,435 acres in Alternative 3 while the acreage categorized as Ecologically Intact ranged from 103,338 acres in Alternative 1 to 261,609 acres in Alternative 6. Acreages of the two high value land categories combined (Ecologically Core and Ecologically Intact) ranged from 174,125 acres in Alternative 1 to 438,115 acres in Alternative 6, in this instance varying by a factor of over 2.5. Land categorized as Ecologically Core constituted between 9 and 16% of the DFAs for the six alternatives, and Ecologically Intact lands constituted between 15 and 22% of the DFAs (Figure D-2). It is not clear whether the Ecologically Core and Intact lands within each DFA would be developed--or made available for development. However, it would appear that a significant percentage of the acreage—and land areas-- in each Alternative would consist of the highest two categories of ecologically important lands, an undesirable result.

Comparing the Alternatives, Alternative 6 had the highest percentage and greatest acreage of DFA land that was designated as Ecologically Core or Ecologically Intact, at 37% and over 438,000 acres. At 24%, alternative 4 had the lowest percentage of DFA lands categorized as Ecologically Core or Ecologically Intact, while alternative 1 had the fewest acres of DFA lands categorized as Ecologically Core or Ecologically Intact, at just over 174,000 acres. Alternative 6, which has highest DFA acreage within the Mojave Desert of California (nearly 1.2 million acres), also had the greatest acreage DFA land designated as either Moderately Degraded or Highly Converted. However, it is alternative 4 that has the highest percentage (at 76%) of DFA land designated as either Moderately Degraded or Highly Converted.

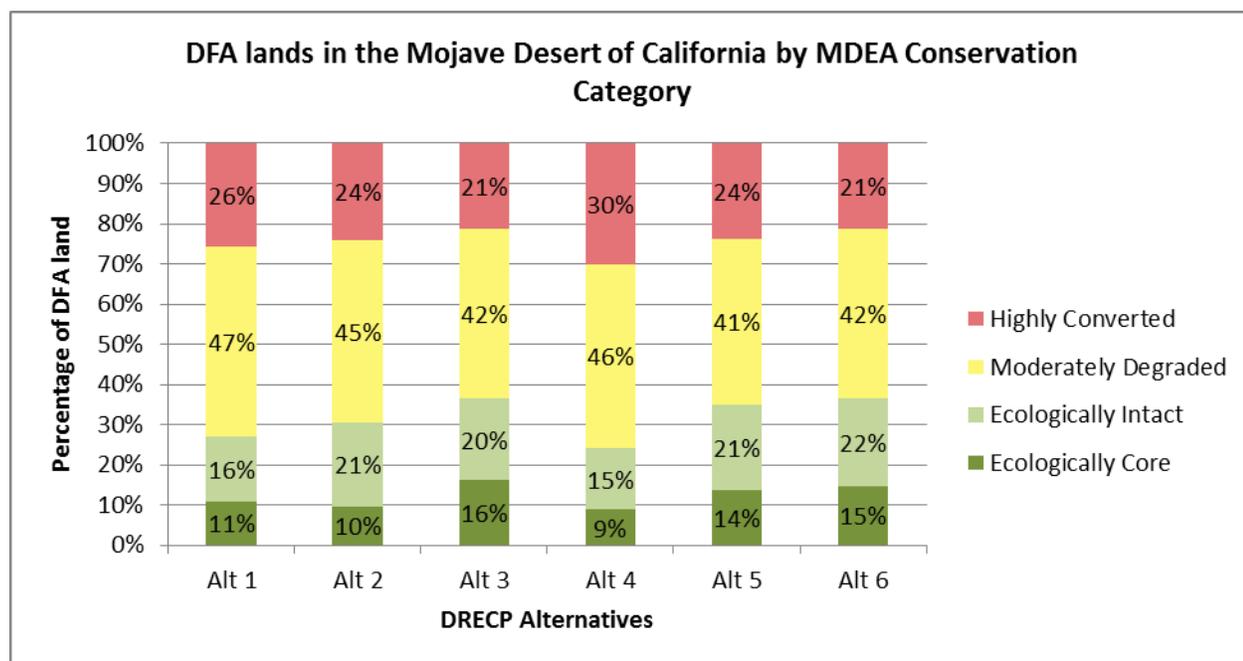
In contrast with DFA lands, CARS lands for the six alternatives differ much less in the acreages and percentages of each conservation category they contain (Figure D-3). For all six alternatives, about 82% of the land in the CARS in categorized as either Ecologically Core or Ecologically Intact. Alternative 1 has the greatest acreage of

CARS lands designated as either Ecologically Core or Ecologically Intact (4.5 million acres). The CARS for alternative 1 also contains the greatest acreage of lands categorized as either Moderately Degraded or Highly Converted (over 1 million acres).

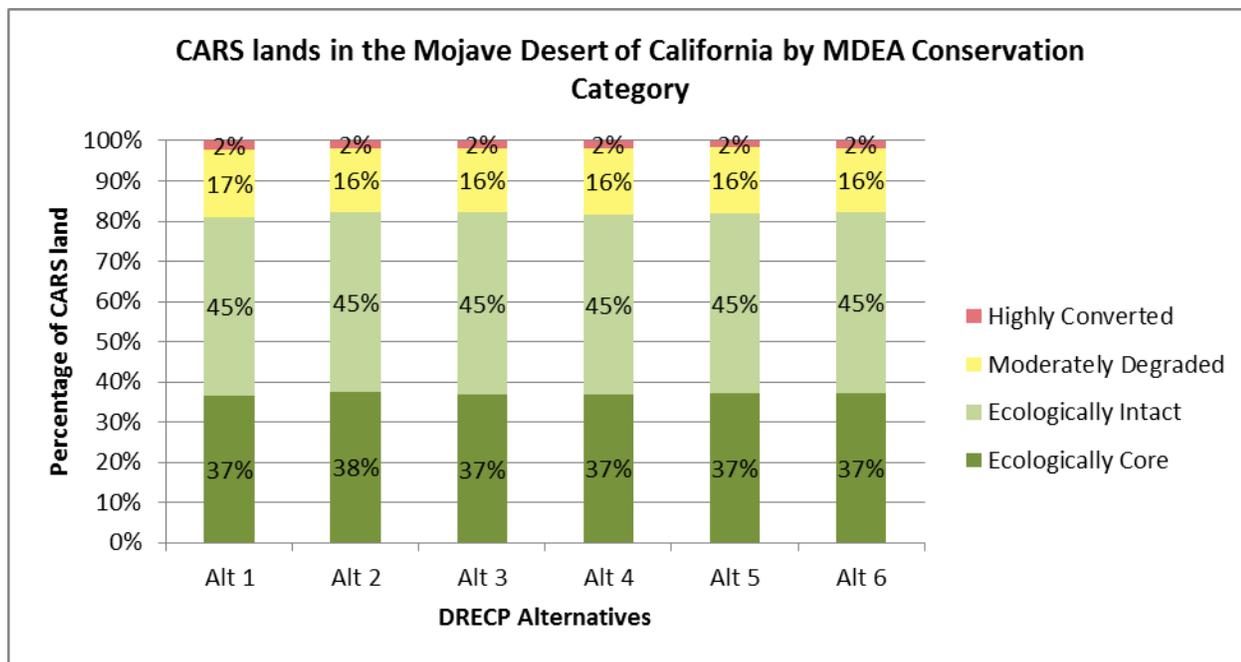
The impacts of DFA development would weigh more heavily on particular subregions of the Mojave Desert of California (Table D-3). For all six alternatives, the majority of DFA lands (60-77%) occur in the Western Mojave subregion. The South-Central Mojave comes in second, with between 15 and 18% of DFA lands occurring in this subregion. Between 5 and 11% of DFA lands are found in the Central Mojave subregion. For all six alternatives, the remaining subregions contain 6% or less of the DFA lands.

The conservation value of DFA lands varies by subregion, resulting in important spatially-explicit differences in the potential impact of each alternative. For example, while only 2% of the DFA land for alternative 5 is found in the South-Eastern subregion, nearly 100% of this land (over 18,000 acres) is categorized as Ecologically Core or Ecologically Intact. This is not an isolated case, as there are several instances where the majority of a subregion's DFA lands for a particular alternative are categorized as either Ecologically Core or Ecologically Intact. This is true in the Eastern Mojave for alternatives 1, 5, and 6; in the Northern Mojave for alternatives 1, 2, 3, 5, and 6, and in the South-Eastern Mojave for alternatives 5 and 6. In contrast with DFA lands, CARS lands for the six alternatives differ very little by subregion in the acreages and percentages of each conservation category they contain.

**Figure D-2:** Percent of total land area for each of the four conservation value categories found within the draft DRECP *Development Focus Area* for each of the six draft DRECP alternatives from December 17, 2012. Results are for the Mojave Desert of California.



**Figure D-3:** Percent of total land area for each of the four conservation value categories found within the draft DRECP *Conservation Area Reserve System* for each of the six draft DRECP alternatives from December 17, 2012. Results are for the Mojave Desert of California.



**Table D-3:** Acres of land in the six subregions of the Mojave Desert of California by conservation value category as covered by the six draft DRECP *Development Focus Area* alternatives from December 17, 2012. Percentages represent, for a given alternative, the relative amount of DFA land found in each subregion.

	Central	Eastern	Northern	South-Central	South-Eastern	Western
<b>Alternative 1</b>						
Ecologically Core	7,301	4,694	15,366	13,398	7,414	22,614
Ecologically Intact	7,507	10,751	6,996	14,986	949	62,199
Moderately Degraded	39,467	2,210	1,744	76,655	11,062	172,882
Highly Converted	13,500	209	1,094	13,605	0	137,431
	11%	3%	4%	18%	3%	61%
<b>Alternative 2</b>						
Ecologically Core	6,003	7,502	15,009	13,756	0	59,688
Ecologically Intact	6,027	47,113	7,547	27,288	0	132,732

<b>Moderately Degraded</b>	38,076	11,305	3,558	113,773	0	308,690
<b>Highly Converted</b>	13,684	0	2,425	16,081	0	221,208
	6%	6%	3%	16%	0%	69%

#### Alternative 3

<b>Ecologically Core</b>	4,560	0	12,806	21,292	0	152,777
<b>Ecologically Intact</b>	6,027	0	165	45,213	0	190,908
<b>Moderately Degraded</b>	36,819	0	899	109,123	0	353,110
<b>Highly Converted</b>	13,678	0	0	17,995	0	221,348
	5%	0%	1%	16%	0%	77%

#### Alternative 4

<b>Ecologically Core</b>	5,996	0	14,344	14,217	0	39,173
<b>Ecologically Intact</b>	6,027	0	8,718	25,286	0	87,598
<b>Moderately Degraded</b>	38,076	0	2,863	95,074	0	246,206
<b>Highly Converted</b>	13,684	0	27,992	16,161	0	192,961
	8%	0%	6%	18%	0%	68%

#### Alternative 5

<b>Ecologically Core</b>	7,090	7,502	20,723	21,695	7,739	89,541
<b>Ecologically Intact</b>	6,027	47,113	10,627	33,335	10,805	135,745
<b>Moderately Degraded</b>	39,835	11,305	3,672	99,757	75	309,865
<b>Highly Converted</b>	13,748	0	28,220	18,015	0	211,144
	6%	6%	6%	15%	2%	66%

#### Alternative 6

<b>Ecologically Core</b>	26,687	17,947	22,228	24,092	19,824	65,727
<b>Ecologically Intact</b>	11,901	44,242	15,767	42,912	18,874	127,914
<b>Moderately Degraded</b>	47,630	10,531	5,418	121,856	20,757	297,932

<b>Highly Converted</b>	13,746	211	2,494	17,069	214	220,152
	8%	6%	4%	17%	5%	60%

According to the DRECP’s evaluation of the sensitivity of lands within the DFAs, the Eastern, Northern and South-Eastern subregions of the Mojave Desert of California contain DFA lands with a high percentage of lands designated as “Highly Biologically Sensitive” or “Moderately Biologically Sensitive” (Table D-4). In contrast, the DFA lands found within the Central, South-Central, and Western subregions are of lower biological sensitivity.

**Table D-4:** Percent of total draft DRECP *Development Focus Area* that is categorized as either “Highly Biologically Sensitive” or “Moderately Biologically Sensitive” by the DRECP for each of the six draft alternatives from December 17, 2012. Results are shown for the six subregions of the Mojave Desert of California.

	Central	Eastern	Northern	South-Central	South-Eastern	Western
<b>Alternative 1</b>	16%	100%	55%	13%	89%	2%
<b>Alternative 2</b>	8%	100%	68%	28%	-	20%
<b>Alternative 3</b>	6%	-	91%	38%	-	39%
<b>Alternative 4</b>	8%	-	83%	22%	-	8%
<b>Alternative 5</b>	12%	100%	78%	27%	100%	24%
<b>Alternative 6</b>	39%	100%	70%	34%	94%	18%

### Limitations on this Evaluation

This analysis is subject to the same limitations as the Conservancy’s 2010 Mojave Desert Ecoregional Assessment plus some additional limits. The MDEA found important gaps and inconsistencies in the data available for analysis, including:

- Incomplete knowledge of and data on the distribution and status of conservation features. Locations of all occurrences of many Mojave Desert species are not known, and many occurrences that have been recorded have not yet been uploaded into publicly available databases. For example, it has been estimated that nearly 10% of the plant taxa in the California deserts have not yet been described and scientifically named (Andre and Hughson 2009).
- Spatially-explicit data on important ecological processes such as groundwater infiltration, recharge and surface feature linkage areas, and aeolian sand transport areas are not available, other than for a few, limited geographic areas.
- Significant inconsistencies exist in the categorization and mapping of natural communities and ecological systems by the available sources. For example, areas mapped as Sparsely Vegetated and Barren within one data source (i.e., LANDFIRE data) are mapped in 73 different ecological systems in

another (i.e., ReGAP data). In each of the available data sources we also found areas that were clearly incorrectly categorized, as discerned through inspection of available imagery.

In addition to these and other limitations described in the MDEA, we made the following assumptions in this evaluation:

- All the area in every DFA would be available for development for renewable energy. However, the *Description and Comparative Evaluation of Draft DRECP Alternatives* assumes that a total of 250,000 to 500,000 acres<sup>6</sup> of land in California's Deserts will be developed for renewable energy over the life of the DRECP and in all six of the draft integrated alternatives the total acreage of the DFAs within the California deserts (Mojave and Sonoran) is at least 1,120,092 acres.
- All conservation features in areas developed for renewable energy would be eliminated.
- Future renewable energy development would not necessarily be limited to DFAs, since existing projects are exempt from DRECP coverage, and projects proposed after adoption of the DRECP could be permitted in areas not designated as DFAs.

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<sup>6</sup> Description and Comparative Evaluation of Draft DRECP Alternatives. Page 1.2-22.