

**Southern Nevada Public Land Management Act
Multi-Species Habitat Conservation Plan
Round 19**

Clark County Desert Conservation Program



desert conservation
PROGRAM

Fine-Scale Vegetation Map of Clark County

Amount Requested: \$1,000,000

A. BACKGROUND INFORMATION

The Clark County Desert Conservation Program (DCP) has identified a need to secure an amendment to the Multiple Species Habitat Conservation Plan (MSHCP) and associated Section 10(a)(1)(B) incidental take permit. In planning for the MSHCP Amendment, DCP is required to monitor and plan for mitigation of habitat loss and to conduct a wide range of analyses to support the goals of the program. Currently, the County Ecosystem Map (Map 1) has been used to accomplish these goals. This map was originally developed based on the 1996 USGS-GAP land cover data, with mesquite and acacia area updates from the Bureau of Land Management in 1997 incorporated by Clark County DCP in 2000. In 2011 the map was further updated using the SWReGAP dataset to refine the 11 defined ecosystems (Heaton, et al. 2011).

In order to manage resources and effectively plan land use, there is a need for accurate and up to date detailed vegetation maps. While the County Ecosystem Map is adequate at displaying the distribution of ecosystems across the County, it does not provide detailed information on vegetation assemblages, which are required for accurate models and assessments of impacts and conservation actions. Further, changes have occurred to the vegetation and there have been many improvements to the spatial data standards and methods since the County Ecosystem Map was developed that make development of a fine-scale vegetation map more attainable. Therefore, the DCP has begun the development of an update to the current spatial vegetation dataset.

The new spatial vegetation dataset is being prepared in accordance with the National Vegetation Classification System (NVC) (USNVC 2021), which will result in a product that has wide utility for a variety of federal and local land management agencies including Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, and many others. This product will align with similar vegetation mapping efforts that have occurred in surrounding areas (e.g., Lake Mead National Recreation Area, Mojave National Preserve, and Death Valley National Park), resulting in a significant part of the Mojave Desert having access to fine-scale vegetation data for the region.

The Fine-scale Vegetation Map project will be accomplished in three phases (refer to Table 1), with Phase I of the project currently underway. The full project area will cover a total of 4,185,089 acres within Clark County, Nevada (Map 2). DCP has worked with a contractor to develop a proposed approach to completing the spatial vegetation dataset, including developing a vegetation sampling design, conducting vegetation sampling to inform the spatial dataset, performing an accuracy assessment of the map product, and further refinement of the map based on the accuracy assessment. Phase I of the project consists of the coarse-scale mapping effort. The DCP has fully funded Phase I (coarse-scale vegetation map) by committing Section 10 funds to conduct this work. Phase I tasks include development of the project approach, development of the local taxonomic classifications, and coarse-level mapping. Under Phase I, existing NVC vegetation delineations and classification products have been reviewed and a set of appropriately scaled NVC vegetation classes to establish an array of target types for the coarse-scale vegetation mapping has been compiled. Tables 2 and 3 (USNVC 2021) below lists the classification levels and gives examples of what that level would entail.

Table 1
Spatial Vegetation Dataset Project Phases and Funding Sources

| Phase | Funding Source | Scope of Work [Products] |
|---|----------------|--|
| I (coarse-level map) | Section 10 | Create a summary of existing NVCs Groups known, or thought to exist in Clark County. The draft list will include the Ecological Systems used in the ReGAP mapping efforts. Included will be any existing Alliances related to the Group level and preliminary Group descriptions. Refinement of the NVCS Classification based on countywide verification ground-truthing efforts. Incorporate data from other studies in and around Clark County. Finalize the file geodatabase and taxonomic classification files for natural vegetation group level and cultural vegetation class level. |
| II (fine-scale map) | SNPLMA | Refinement of the NVCS Classification based on countywide verification ground-truthing efforts completed in Phase I. Add additional levels to the spatial and taxonomic classifications and refine descriptions of each class to ensure that mapping and taxonomy reach the Alliance level for natural vegetation and Subformation level for cultural vegetation. |
| III (accuracy assessment and field verification) | Section 10 | Perform a further refinement and assessment of the accuracy of the spatial classification. This is to ensure that the appropriate level of confidence is placed when using this dataset for analysis. During this step more than 1,500 sites will be visited and assessed to determine whether the Fine-scale Vegetation Map is correct, and if not found to be an accurate representation of the on-the-ground vegetation the classification will be further refined to reflect the necessary corrections. |

Following review and development of the vegetation delineations and classifications, it was determined that the NVC Group level for natural vegetation, and the NVC Subformation level for cultural vegetation, were best suited for the purpose of developing the coarse-level dataset (refer to Tables 3 and 4 for examples of the level of detail and specificity associated with this classification system). Existing taxonomic classes were evaluated for suitability for incorporation into the coarse-scale vegetation dataset. Areas that had NVC classifications completed within the last 5 years and also had adequate quality standards were excluded from the project area (e.g., Lake Mead National Recreation Area). The coarse-level dataset is currently being developed in a stepwise process across 22 work zones (Map 3) that have been defined for the project area. To date, 10 work zones have been completed at the coarse level. Coarse-level mapping will be supported by ground-based verification work. After the mapping is in a draft stage, an assessment of the accuracy of the map will be started. The accuracy assessment will include target selection, fieldwork, analysis, and map refinement phases. Phase I is scheduled to be completed in June 2022.

The project described in this nomination will build on the coarse-level mapping effort completed in Phase I to achieve a higher degree of specificity in location and vegetation classes to align with other vegetation mapping efforts that have been completed across the Mojave Desert. The taxonomic and spatial specificity of the Phase I product will be further refined to the Alliance level for natural vegetation (Table 2) and Cultural Subformation for cultural vegetation (Table 3).

Phase III (accuracy assessment and further refinement) will commence as a separate project using Section 10 funding once Phase II is complete. Work completed under Phase III will give users of the dataset a better understanding of the reliability and accuracy of the data for each classification. This will be completed through on-the-ground observations by trained staff to evaluate the accuracy of the initial mapping effort, identify if issues exist with the classification, and then correct issues in accuracy by further refinement of the spatial dataset.

Table 2 (USNVC 2021)

Criteria and examples of the levels of the revised NVC hierarchy for natural vegetation

| Hierarchy For Natural Vegetation | Vegetation Classification Criteria | Ecological Context | Scientific Name | Colloquial Name |
|----------------------------------|---|---|---|---|
| Upper Levels | Predominantly physiognomy | | | |
| 1 Formation Class | Broad combinations of general dominant growth forms. | Basic temperature (energy budget), moisture, and substrate/aquatic conditions. | Mesomorphic Tree Vegetation Class | Forest & Woodland |
| 2 Formation Subclass | Combinations of general dominant and diagnostic growth forms. | Global macroclimatic factors driven primarily by latitude and continental position, or overriding substrate/aquatic conditions. | Temperate & Boreal Forest & Woodland Subclass | Temperate & Boreal Forest & Woodland |
| 3 Formation | Combinations of dominant and diagnostic growth forms. | Global macroclimatic factors as modified by altitude, seasonality of precipitation, substrates, and hydrologic conditions. | Cool Temperate Forest & Woodland Formation | Cool Temperate Forest & Woodland |
| Middle Levels | Physiognomy, biogeography, and floristics | | | |
| 4 Division | Combinations of dominant and diagnostic growth forms and a broad set of diagnostic plant species that reflect biogeographic differences. | Continental differences in mesoclimate, geology, substrates, hydrology, and disturbance regimes. | <i>Pseudotsuga menziesii</i> - <i>Tsuga heterophylla</i> - <i>Tsuga mertensiana</i> Vancouverian Forest & Woodland Division | Vancouverian Cool Temperate Forest & Woodland |
| 5 Macrogroup | Combinations of moderate sets of diagnostic plant species and diagnostic growth forms that reflect biogeographic differences. | Sub-continental to regional differences in mesoclimate, geology, substrates, hydrology, and disturbance regimes. | <i>Calocedrus decurrens</i> - <i>Pinus jeffreyi</i> - <i>Abies concolor</i> var. <i>lowiana</i> Forest Macrogroup | Southern Vancouverian Dry Foothill Forest & Woodland |
| 6 Group | Combinations of relatively narrow sets of diagnostic plant species, including dominants and co-dominants, broadly similar composition, and diagnostic growth forms. | Regional mesoclimate, geology, substrates, hydrology and disturbance regimes. | <i>Quercus garryana</i> - <i>Pinus ponderosa</i> - <i>Pseudotsuga menziesii</i> Forest & Woodland Group | Cascadian Oregon White Oak - Conifer Forest & Woodland |
| Lower Levels | Predominantly floristics | | | |
| 7 Alliance | Diagnostic species, including some from the dominant growth form or layer, and moderately similar composition. | Regional to subregional climate, substrates, hydrology, moisture/nutrient factors, and disturbance regimes. | <i>Quercus garryana</i> - <i>Pinus ponderosa</i> / <i>Carex geyeri</i> Woodland Alliance | Oregon White Oak - Ponderosa Pine / Geyer's Sedge Woodland Alliance |
| 8 Association | Diagnostic species, usually from multiple growth forms or layers, and more narrowly similar composition. | Topo-edaphic climate, substrates, hydrology, and disturbance regimes | <i>Pinus ponderosa</i> - <i>Quercus garryana</i> / <i>Balsamorhiza sagittata</i> Woodland | Ponderosa Pine - Oregon White Oak / Arrowleaf Balsamorhiza Woodland |

Table 3 (USNVC 2021)

Criteria and examples of the levels of the revised NVC hierarchy for cultural vegetation

| Hierarchy For Cultural Vegetation | Classification Criteria | Example 1 | Example 2 |
|--------------------------------------|---|------------------------------------|--------------------------------|
| Upper | Physiognomy and ecology | | |
| Level 1 – Cultural Class | Combination of dominant growth forms adapted to relatively intensive human manipulations, as reflected in relatively rapid changes in structure and/or composition. | Agricultural Vegetation | Agricultural Vegetation |
| Level 2 – Cultural Subclass | Combinations and degree of herbaceous versus woody growth forms | Herbaceous Agricultural Vegetation | Woody Agricultural Vegetation |
| Level 3 – Cultural Formation | Canopy structure of dominant growth forms is annually converted or heavily manipulated / harvested. | Cultivated crop | Woody Horticultural Crop |
| Level 4 – Cultural Subformation | Spatial structure of the vegetation, including whether in swards, rows, and degree of manipulation to the canopy. | Row Crop | Orchard |
| Mid | Physiognomy and floristics | | |
| Level 5- Cultural Group [optional] | Common set of growth forms and many diagnostic plant taxa sharing a broadly similar region and climate, and disturbance factors | Temperate and Tropical Row Crop | Temperate and Tropical Orchard |
| Level 6 – Cultural Subgroup | Common set of growth forms and diagnostic species (taxa) preferentially sharing a similar | Corn | Fruit – Orchards |
| Subgroup | Set of regional edaphic, topographic, and disturbance factors. | | |
| Lower | Predominantly floristics | | |
| Level 7 – Cultural Type | Dominant or co-dominant species, as well as habitat conditions, and physiognomy. | Sweet Corn | Apple |
| Level 8- Cultural Subtype [optional] | Dominant or co-dominant species, in conjunction with a characteristic set of associated species, habitat conditions and physiognomy | | |

References:

Heaton, J. S., Miao, X., Von Seckendorff Hoff, K., Charlet, D., Cashman, P., Trexler, J., Grimmer, A., and Patil, R. 2011. Final Report 2005-UNR-578. Report to Clark County MSHCP 2005-UNR-578:D27.

USNVC [United States National Vegetation Classification]. 2021. United States National Vegetation Classification Database, V2.031. Federal Geographic Data Committee, Vegetation Subcommittee, Washington DC. [usnvc.org] (accessed July 1, 2020)

2. **Describe relationship to prior approved phases or related SNPLMA projects and anticipated future phases:**

There are no prior or future phases related to SNPLMA.

3. **Acknowledgement of stand-alone project and no guarantee of funding for future phases:**

Phase II has been designed as a standalone project. No future funding would be needed to complete the fine-scale vegetation dataset.

B. SNPLMA STRATEGIC PLAN VALUES

MSHCP projects have two goals identified in the Strategic Plan:

- Goal 1: Sustain the quality of the outdoor environment by conserving, preserving, and restoring natural and cultural resources.
- Goal 2: Improve the quality of life for all publics in urban and rural communities by enhancing recreational opportunities that connect people with the outdoor environment.

Nominated projects should meet these goals by focusing on the three SNPLMA core values, connectivity, sustainability, and community. Every nomination must explain how the three values are promoted by the project.

1. Sustainability:

The Fine-scale Vegetation Map project is crucial for understanding the current state of the natural environment. This will achieve Goal 1 by allowing land managers across Clark County to prioritize preservation and conservation efforts in habitats that are at risk or underrepresented in the County. This will also allow land managers to more fully understand the resources that proposed projects could potentially impact to allow for sustainable site selection. Several other landscape characteristics will also be incidentally collected in the human built environment, such as structures, roads, parking lots, etc.

2. Connectivity:

The basis for connectivity is understanding the locations where a species occurs or where likely habitat for those species can be found. The Fine-scale Vegetation Map is an important component for developing species distribution models for all potentially covered species under the Clark County MSHCP Amendment. These species distribution models will allow land managers to identify the locations of important habitat for each species in order to maintain connectivity between disparate populations.

3. Community:

The Fine-scale Vegetation Map will be used to support development and implementation of the Clark County MSHCP Amendment and to aid in enhancing publically-accessible conservation areas. Further, this data would be made available to the public via the County's public-facing website so the public may better understand the outdoor environment in a more significant way.

C. PURPOSE STATEMENT

The purpose of this project is to create a fine-scale, detailed spatial vegetation dataset that can be used to more accurately model species distributions, to determine impacts to species and habitats, to evaluate proposed conservation actions, and for use in a variety of other modeling efforts that support meeting the Biological Goals and Objectives of the proposed MSHCP Amendment.

D. PROJECT DELIVERABLES

1. Primary Deliverables:
 - a. Taxonomic Vegetation Classification
 - b. Fine-scale Spatial Vegetation Dataset
2. Anticipated Deliverables:
 - a. N/A
3. Standard Deliverables:
 - a. Ongoing administration of financial instrument.
 - b. Pre-award planning, scoping, and budgeting activities and award of contract(s).
 - c. Issuance of project completion notice from DCP to BLM/SNPLMA.
 - d. Issuance of final payment made to contractor(s).
 - e. Final report to BLM/SNPLMA.
 - f. Notice of project completion to BLM/SNPLMA

E. PROJECT LOCATION

The Fine-scale Vegetation Map will address all land within Clark County except land administered by the U.S. Department of Defense and the Lake Mead National Recreation Area.

Latitude and Longitude:

- Please see Map 2

Congressional District(s):

- All Congressional Districts in Clark County, Nevada

F. PROJECT TIMEFRAME

5 Years

G. LEVEL OF PROJECT READINESS FOR IMPLEMENTATION

Is this a shovel-ready project (explain if “Yes”): Yes -or- No

Work on Phase II can begin as soon as Phase I efforts are completed. Phase I will be completed in June 2022.

H. FUTURE OPERATION AND MAINTENANCE

This project consists of the development of a fine-scale vegetation dataset. There are no anticipated operations and maintenance costs associated with the project.

I. PROJECT BUDGET

The DCP is requesting \$1,000,000.00 to complete this project.

Partnership and/or Contributed Funds:

There are no partnership or contributed funds for this project; Phase II has been designed to be a stand-alone project and would be 100 percent funded through the SNPLMA program.

J. KEY CONTACTS

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K. ORDERS AND PRIORITIES

A. Executive Orders (EO):

- ***EO No. 13855: Promoting Active Management of America's Forests, Range Lands to Improve Conditions and Reduce Wildfire Risk***

Answer: The proposed project will aid land managers in understanding the vegetation characteristics across large areas to aid in focusing resources as efficiently as possible, including locating vegetation types that may pose a higher risk for wildfire.

- ***EO No. 14005: Ensuring the Future is Made in All of America by All of America's Workers***

Answer: The proposed project is committed to using businesses based in the United States for the development of this dataset. No manufactured goods will be used in this project and all products will be digital and produced in the United States.

B. Secretarial Orders

- ***SO No. 3347: Conservation Stewardship and Outdoor Recreation.***

Answer: The proposed product will augment knowledge of the outdoors to aid specifically in conserving land and evaluating all projects in Clark County Nevada to ensure that habitat is not disproportionately taken. This will also be an aid to outdoor enthusiasts in understanding where to find and experience the wide variety of vegetation in Clark County, Nevada.

- ***SO No. 3356: Hunting, Fishing, Recreational Shooting, and Wildlife Conservation Opportunities and Coordination with States, Tribes and Territories.***

Answer: Animal habitat is often strongly correlated to the plant species that are growing in an area. The proposed product will aid in identifying habitat for hunting and wildlife conservation. This data will be made freely available and will encompass land owned and administered by federal, state, local, and tribal entities.

- ***SO No. 3362: Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors.***

Answer: The proposed product will aid in identifying where these corridors exist in Clark County by identifying types of vegetation that can be identified as foraging opportunities along the migration corridors. Having this data will allow for resources to be used most efficiently to identify and protect these foraging areas.

- ***SO No. 3366: Increasing Recreational Opportunities on Lands and Waters Managed by the U.S. Department of the Interior***

Answer: Identifying where certain vegetation classes are can aid in the management of recreation areas, and allow to land managers and the public to find scenic and unique areas throughout the project area.

- ***SO No. 3370: Conservation Stewardship and Increasing Public Access to Urban National Wildlife Refuges.***

Answer: The proposed project will map vegetation classes throughout the Desert National Wildlife Refuge in Clark County, giving visitors and managers of the Desert National Wildlife Refuge information on the types of vegetation they may encounter and where to find specific at-risk types of vegetation classes.

- ***SO No. 3372: Reducing Wildfire Risks on Department of the Interior Land Through Active Management.***

Answer: Wildfire risks are often associated with specific types of vegetation, specifically, dense, dry types of vegetation and areas where non-native species

predominate. Classifying vegetation types by predominant species will aid land managers to specifically target areas for management and evaluate fire risk more efficiently.

- ***SO No. 3373: Evaluating Public Access in Bureau of Land Management Public Land Disposal and Exchanges (focus is on Sec. 4.b.(3) Potential increased public recreational access to existing public lands resulting from the proposed land acquired through an exchange (acquisition).***

Answer: Not applicable

- ***SO No. 3374: Implementation of the John D. Dingell, Jr. Conservation, Management and Recreation Act.***

Answer: Not applicable.

- ***SO No. 3376: Increasing Recreational Opportunities through the use of Electric Bikes.***

Answer: Not applicable.

C. Department of the Interior Priorities:

1. **Identifying steps to accelerate responsible development of renewable energy on public lands and waters.** *We are investing in climate research and environmental innovation to incentivize the rapid deployment of clean energy solutions, while reviewing existing programs to restore balance on America's public lands and waters to benefit current and future generations.*

Answer: The proposed project will clearly map vegetation classes that can be identified as likely containing species that require conservation. Understanding where these species exist will help renewable energy projects quickly and efficiently choose site locations prior to field work that are least likely to impact species of concern.

2. **Strengthening the government-to-government relationship with sovereign Tribal nations.** *We understand that tribal sovereignty and self-governance, as well as honoring the federal trust responsibility to Tribal Nations, must be the cornerstones of federal Indian policy.*

Answer: The proposed project covers land from 3 sovereign Tribal nations and the spatial dataset will be freely available to them. This data can be used for any purpose and for no cost. Each nation was approached at the beginning of the planning process to seek cooperation in land access for accuracy assessments and field verification visits. Nations that are actively developing solar will be able to more easily and rapidly evaluate proposed solar development areas to be able to determine what vegetation types and habitats might be impacted.

- 3. Making investments to support the Administration’s goal of creating millions of family-supporting and union jobs.** *This includes establishing a new Climate Conservation Corps Initiative to put a new generation of Americans to work conserving and restoring public lands and waters, increasing reforestation, increasing carbon sequestration in the agricultural sector, protecting biodiversity, improving access to recreation, and addressing the changing climate.*

Answer: The proposed project will directly create approximately 10-20 full time jobs for the length of the project. This proposed project will also be a baseline used by many organizations for protecting biodiversity and improving access to recreation opportunities through identifying vegetation types that may have value to those organizations. Additionally this project is a key component of the MSHCP permit amendment effort. As part of that effort an economic evaluation was completed and an amended MSHCP permit “would result in an estimated 45,000 job-years of employment, \$2.3 billion of labor income (in current dollars), \$6.7 billion of additional revenue for area businesses and an additional \$3.8 billion of value added on top of the projected impacts for the remainder of the existing MSHCP.” (Applied Analysis 2016).

Applied Analysis. 2016, Economic Analysis of the Multiple Species Habitat Conservation Plan, Clark County, NV. Available online:
<https://www.clarkcountynv.gov/Environmental%20Sustainability/DCP%20Reports/2017/MSHCP%20Economic%20Analysis.pdf> (Accessed 11/3/2021)

- 4. Working to conserve at least 30% each of our lands and waters by the year 2030.** *We will work to protect biodiversity, slow extinction rates, and help leverage natural climate solutions by conserving 30% of America’s lands and waters by 2030. This relies on support for local, state, private, and tribally led conservation and restoration efforts that are underway across America.*

Answer: Understanding which habitats and vegetation classes may be at risk is the first step towards conserving them. The proposed project helps to lay the groundwork for the goals of protecting biodiversity, slowing extinction rates, and helping to leverage natural climate solutions.

- 5. Centering equity and environmental justice.** *The impacts of the multiple crises in the United States are not evenly distributed in our society. Communities of color, low-income families, and rural and indigenous communities have long suffered disproportionate and cumulative harm from air pollution, water pollution, and toxic sites. At every step of the way, Interior will engage diverse stakeholders across the country, as well as conduct formal consultation with Tribes in recognition of the U.S. government’s trust responsibilities.*

Answer: Though this project does not directly relate to this priority, the proposed project will cover the entire area inside Clark County and all effort will be evenly distributed, regardless of community.

D. Forest Service Priorities:

1. ***Controlling the COVID-19 pandemic***

Answer: Not applicable

2. ***Providing economic relief***

Answer: Not applicable.

3. ***Tackling climate change***

Answer: The proposed project will establish a baseline vegetation map that can be used to track climate change and allow for faster and more efficient evaluation of renewable energy projects while protecting sensitive habitats within Clark County.

4. ***Advancing racial equity***

Answer: Not applicable.

5. ***Improving our workforce and work environment***

Answer: The proposed project will help to inform the workforce of the types of vegetation covering U.S. Forest Service land in Clark County. This will help those in the workforce that provide analysis by providing the tools to help them do their job more efficiently and effectively.