

**Award Number:** P14AC00284

**Project Number**: UNM-97

**CFDA #:** 15.945

**Park/NPS Unit: White Sands National Monument and Chihuahuan Desert I&M Network**

**Title of Project: A Vegetation Map for White Sands National Monument, New Mexico:**

**Phase II**

**Administered through the:**  Colorado Plateau Cooperative Ecosystem Studies Unit Cooperative Agreement Number H1200-09-0005

**CESU Partner: Natural Heritage New Mexico, University of New Mexico**

**PROJECT CONTACTS:**

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**FUNDING INFORMATION:**

**Amount Funded: $69,492**

**NPS Account Numbers (amounts in parentheses):** **PX.XNR4I0110.00.1**

**Fund Source (e.g., ONPS, FLREA, CRPP, CESU, etc.): ONPS**

NPS Funding

Is this funded using a reimbursable account number? If yes, IMR contracting needs a copy of the Interagency Agreement.

**PROJECT DATES:**

**Start Date: May 19, 2014 (Tentative date)**

***NOTE: This Task Agreement will become effective on the date of final signature or the effective date of the Award document, whichever is later.***

**End Date: November 30, 2015** *(please make end date the last day of the month if possible)*

**NPS Administrative Contacts**

**CESU Coordinator:** Judy Bischoff, National Park Service/CPCESU, NAU P.O. Box 5765, Flagstaff, AZ 86011, 928-523-6638, Fax: 928-523-2014; [judy\_bischoff@nps.gov](mailto:judy_bischoff@nps.gov)

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**FEDERAL FINANCIAL REPORTS AND DRAWDOWN SCHEDULE:**

***Federal Financial Reports*** (Check as required for project based on spending plan, period of performance, risk, cooperator history, etc.)

{X} Quarterly { } Semi-annually { } Annually {X} Final

**Project SCHEDULE AND TECHNICAL REPORT DEADLINES (*all product due dates contiNgent on a mid-may 2014 start date*):**

List all technical reports and products in sequential order as required in the scope (more lines and milestones can be added as needed):

*Project Start Date* – May 19, 2014

*Project progress updates –* due monthly

*Technical project progress statements (no more than 2 pages)* {X } Quarterly { } Semi-annually

{ } Annually

(Check as needed from PI to monitor progress of specific project. Content should be addressed in the scope.)  
  
*Investigator’s Annual Report (IAR)* – February 1, 2015

*Database, Datasheets, Collections/Specimens (if occurred), Archives, Images and Maps provided to the NPS ATR or Technical Expert* – various dates between October 1, 2014 and October 1, 2015 (see Gantt chart)

*Draft Final Vegetation Map* – May 1, 2015 (map is not considered final until after the Accuracy Assessment [AA] is completed, which is Phase III of this project – to be funded)

*Draft Final Report* – 1 October, 2015 (report is actually not completed until the results of the AA [chapter 4] are provided. This draft report is chapter 1 and 2 and associated appendices to those 2 chapters.)

*Project End Date* – November 30, 2015

*Final SF425 FFR* must be submitted within 90 days of project end date

**PAYMENTS**

**2 CFR PART 215.22*:*** Cash advance (drawdown) to recipient organization shall be limited to the minimum amounts needed and be timed to be in accordance with the actual immediate cash requirements of the recipient organization in carrying out the purpose of the approved program or project. The timing and amount of cash advances shall be as close as is administratively feasible to the actual disbursements by the recipient organization for direct program or project costs and the proportionate share of any allowable indirect costs.

**2 CFR PART 215.25 (8)(e)(1):** Incur pre-award costs 90 calendar days prior to award or more than 90 calendar days with the prior approval of the Federal awarding agency. All pre-award costs are incurred at the recipient’s risk. (i.e. the Federal awarding agency is under no obligation to reimburse such costs if for any reason the recipient does not receive an award or if the award is less than anticipated and inadequate to cover such costs.)

**CESU REQUIRED PRODUCTS (may be different from those products required by the ATR – See Statement of Work for Products required by the NPS unit):**

The Principal Investigator will prepare a brief report abstract suitable for public distribution and two hard copies and an electronic version (in PDF file format) of the draft final map, provisional vegetation classification. The “final report” can be provided, but the full report is not due until the end of Phase IV (sometime in September 2016). Products should be mailed toJudy Bischoff, National Park Service, CPCESU, NAU P.O. Box 5765, Flagstaff, AZ 86011. Please be sure to include the project number (e.g.; NAU-###, UMT-###, UAZDS-###) and the P number on the cover page of the final report.

**PROJECT ABSTRACT:**

**This project (Phase II) is a continuation of the development of a vegetation classification map and report for White Sands National Monument. At the conclusion of Phase II, a final draft vegetation map will be available, as well a classification hierarchy, classification key and provisional plant community names. All data will have been entered into a PLOTS database, the database required by the NPS Vegetation Mapping Program Office. Upon funding and completion of Phases III and IV, all products associated with this vegetation mapping project will be available for dissemination.**

**Scope of Work:**

1. **INTRODUCTION & BACKGROUND**

Vegetation mapping is an inventory process that documents the composition, distribution and abundance of plant communities across a landscape. It is one of the 12 baseline inventories to be completed for all 270 national parks within the NPS Inventory and Monitoring Program. The Chihuahuan Desert Inventory & Monitoring Network (CHDN) is currently coordinating the development of vegetation maps for Guadalupe Mountains National Park (GUMO), and assisting with the development of maps for Big Bend National Park (BIBE), Rio Grande Wild & Scenic River (RIGR) and Amistad National Recreation Area (AMIS). This project initiates Phase II of vegetation mapping efforts in White Sands National Monument (WHSA).

Through this proposal the Natural Heritage New Mexico Program (NHNM) field crew will complete the collection of vegetation classification and mapping ground control plot data at WHSA. The data collection will occur in early fall FY14, and map development will be completed during FY15. During Phase 3 (FY15/16, *to be funded*), WHSA AA project will be conducted, and in Phase IV (FY16, *to be funded*), the final report will be written and final map developed. Performance of tasks within in each phase may change due to precipitation patterns, logistical constraints and other planning issues.

In 2011, Natural Heritage New Mexico (NHNM) completed a provisional vegetation classification and developed a base map for White Sands National Monument (WHSA) (Phase I) in preparation for developing a final comprehensive vegetation map following the protocols of the National Park Service (NPS) National Vegetation Mapping Program. Using the standard NRTR format, a draft report was developed that included an introductory and study area chapter, and vegetation classification chapter with details on the development classification and descriptions of the vegetation communities of the park. The provisional vegetation classification follows the National Vegetation Classification System (NVCS) standard (FGDC 2008) describes some 60 plant associations based on 385 plots (Table 1). The plant associations in turn were used develop a legend for a preliminary working map composed of 28 map units. Four appendices were compiled: A) the NHNM field handbook; B) Plant species list compiled from the plot data; C) A diagnostic key to the plant association s, and D) detailed plant association descriptions.

In Phase II (current project), NHNM propose to complete the vegetation map for WHSA at a scale of 1:24,000 following the national standards (a minimum mapping unit delineation of 0.5 ha and an overall accuracy of 80%). The total area under consideration is 55,885 ha (138,095 ac). The final map will target, as a minimum, is the Group level of the NVCS and, where possible, individual plant associations within the constraints of the imagery quality and sampling depth. Phase II of the project is expected to be initiated by the late spring of 2014 and be completed by September 2015.

In Phase III (*to be funded*), data will be collected for the WHSA Accuracy Assessment through a Task Agreement with the Lady Bird Johnson Wildflower Center, University of Texas at Austin (or alternate option of CHDN vegetation uplands monitoring crew & other staff accomplishing this in-house). Phase III is expected to run from summer 2015 through spring 2016.

And in Phase IV (*to be funded*), a final report will be delivered in manuscript format for inclusion in the NPS Natural Resource Technical Report series by NHNM. This report will follow the structure and content specifications of previous mapping reports produced for the Vegetation Mapping Program. In addition, a data CD will be compiled containing the original data, a pdf file of the report and map (as a single map sheet at the target scale), and a relational database using the NPS PLOT 3.0 template (or most current version), and the digital map layers in a GIS for use in ArcGIS. Phase IV is expected to being in early 2016 and end in December 2016.

**Table 1. A provisional hierarchical plant association classification for White Sands National Monument. Under “Classification level and Name”, plant associations are presented under their respective NVCS groups. “S” refers to classification status where “E” is an established plant association recognized in the Nation Vegetation Classification System (NVCS). “P” is a provisional association not yet been accepted into the NVCS. “*n*” is the number of plots. “Code” is either the NatureServe national database code (CEGL numbers) for established PAs or NHNM code (NPS or NHNM codes) for provisional ones. Map Units refers to the vegetation map units in which the plant association is considered to be either a primary component (1), secondary component (2), related inclusion (Ri), or contrasting inclusion (Ci).**

| **Classification level and name** | | | | | | | | | | | | | | | | | | | | | **S** | | ***n*** | | **Database Code** | | **Map units** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | |  | |  | | |  | | |  | | | |  | | |  | |  | |  | |  | | 1,2, & Ri | | Ci | |
| 1 Forest & Woodland (Mesomorphic Tree Vegetation) | | | | | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  | 1.C Temperate Forest | | | | | | | | | | | | | | |  | | |  | |  | |  | |  | |  | |  | |
|  |  | 1.C.3 Temperate Flooded & Swamp Forest | | | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  |  | | 1.C.3.d Western North American Warm Temperate Flooded & Swamp Forest | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  |  | |  | | MG036 | | Warm Mediterranean & Desert Riparian, Flooded & Swamp Forest | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  |  | |  | |  | |  | | | G508 | | | | Sonoran-Chihuahuan Lowland Riparian Forest Group | | | | | |  | |  | |  | |  | |  | |
|  |  |  | |  | |  | |  | | |  | | | |  | | | *Populus deltoides* ssp. *wislizeni / Poliomintha incana* Forest | | | E | | 10 | | CEGL005972 | | 6A | |  | |
|  |  |  | |  | |  | |  | | |  | | | |  | | | *Populus deltoides* ssp. *wislizeni / Schizachyrium scoparium* Woodland | | | E | | 5 | | CEGL005973 | | 6A | |  | |
|  |  |  | |  | | MG298 | | Western North American Warm Temperate Ruderal Flooded & Swamp Forest | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  |  | |  | |  | |  | | | G510 | | | | Southwest North American Ruderal Riparian Forest and Shrubland Group | | | | | |  | |  | |  | |  | |  | |
|  |  |  | |  | |  | |  | | |  | | | |  | | | *Tamarix chinensis* (*Allenrolfea occidentalis*) Semi-natural Shrubland | | | P | | 17 | | NPS\_NM098 | | 7B | | 8B | |
|  |  |  | |  | |  | |  | | |  | | | |  | | | *Tamarix chinensis / Distichlis spicata* Semi-natural Shrubland | | | P | | 8 | | NPS\_NM097 | | 7A | |  | |
|  |  |  | |  | |  | |  | | |  | | | |  | | | *Tamarix chinensis* Gypsum Dune Semi-natural Shrubland | | | P | | 17 | | NPS\_NM094 | | 7C | |  | |
|  |  |  | |  | |  | |  | | |  | | | |  | | | *Tamarix chinensis / Sporobolus airoides* Semi-natural Shrubland | | | P | | 18 | | NPS\_NM099 | | 7A | |  | |
| 2 Shrubland & Grassland (Mesomorphic Shrub & Herb Vegetation) | | | | | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  | 2.C Temperate & Boreal Shrubland & Grassland | | | | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  | 2.C.6 Salt Marsh | | | | | | | | | | | | | |  | | |  | |  | |  | |  | |  | |  | |
|  |  |  | | 2.C.6.d North American Western Interior Brackish Marsh | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  |  | |  | | MG083 | | | Warm Semi-Desert & Mediterranean Alkaline-Saline Wetland | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  |  | |  | |  | | |  | | | G539 | | | | North American Warm Desert Alkaline Scrub & Herb Playa & Wet Flat Group | | | | |  | |  | |  | |  | |  | |
|  |  |  | |  | |  | | |  | | |  | | | |  | | | *Allenrolfea occidentalis - Atriplex canescens / Sporobolus airoides* Shrubland | | P | | 6 | | NPS\_NM074 | | 2A | | 3B | |
|  |  |  | |  | |  | | |  | | |  | | | |  | | | *Allenrolfea occidentalis* Sparse Shrubland | | P | | 12 | | NPS\_NM075 | | 2A | | 8B | |
|  |  |  | |  | |  | | |  | | |  | | | |  | | | *Allenrolfea occidentalis / Suaeda nigra* Shrubland | | P | | 11 | | NPS\_NM076 | | 2A | |  | |
|  |  |  | |  | |  | | |  | | |  | | | |  | | | *Atriplex canescens / Suaeda nigra S*hrubland | | P | | 6 | | NPS\_NM078 | | 3B | |  | |
|  |  |  | |  | |  | | |  | | |  | | | |  | | | *Distichlis spicata* Southwest Herbaceous Vegetation | | P | | 1 | | NHNM000812 | | 2B | |  | |
|  |  |  | |  | |  | | |  | | |  | | | |  | | | *Sporobolus airoides - Distichlis spicata* Southwest Herbaceous Vegetation | | P | | 1 | | NHNM000811 | | 2B | |  | |
|  |  |  | |  | |  | | |  | | |  | | | |  | | | *Suaeda nigra* Shrubland | | E | | 2 | | CEGL001991 | | 2A | |  | |
| 3 Semi-Desert (Xeromorphic Scrub & Herb Vegetation) | | | | | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  | 3.A Warm Semi-Desert Scrub & Grassland | | | | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  | | 3.A.1 Warm Semi-Desert Scrub & Grassland | | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  | |  | | 3.A.1.a North American Warm Desert Scrub & Grassland | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  | |  | |  | | MG086 | | | Chihuahuan Desert Scrub | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | | |  | | | G288 | | | | Chihuahuan Creosotebush Mixed Desert Scrub Group | | | | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | | |  | | |  | | | |  | | | *Flourensia cernua / Muhlenbergia porteri* Shrubland | | P | | 3 | | NPS\_NM079 | | 4A | |  | |
|  |  | |  | |  | |  | | |  | | |  | | | |  | | | *Larrea tridentata / Muhlenbergia porteri* Shrubland | | E | | 1 | | CEGL001272 | | 4A | |  | |
|  |  | |  | |  | |  | | |  | | |  | | | |  | | | *Larrea tridentata /* Sparse UnderstoryShrubland | | E | | 5 | | CEGL001276 | | 4A | |  | |
|  |  | |  | |  | |  | | |  | | | G287 | | | | Chihuahuan Stabilized Coppice Dune & Sand Flat Scrub Group | | | | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | | |  | | |  | | | |  | | | *Prosopis glandulosa - Atriplex canescens* Shrubland | | E | | 8 | | CEGL001382 | | 5A | |  | |
|  |  | |  | |  | |  | | |  | | |  | | | |  | | | *Psorothamnus scoparius / Sporobolus flexuosus* Shrubland | | E | | 3 | | CEGL001695 | | 1A | |  | |
|  |  | |  | |  | | MG087 | | | Chihuahuan Semi-Desert Grassland & Steppe | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | | |  | | | | G492 | | | Chihuahuan Gypsophilous Grassland & Shrubland Group | | | | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Achnatherum hymenoides / Abronia angustifolia* Herbaceous Vegetation | | P | | 2 | | NPS\_NM093 | | 1C | | 1A | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Frankenia jamesii / Sporobolus airoides* Dwarf-shrub Herbaceous Vegetation | | P | | 3 | | NHNM000255 | | 1C | | 8B | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Sporobolus airoides- Schizachyrium neomexicanum* Herbaceous Vegetation | | P | | 19 | | NPS\_NM091 | | 1C | | 1B | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Bouteloua breviseta - Schizachyrium neomexicanum* Herbaceous Vegetation | | P | | 15 | | NPS\_NM085 | | 1B | |  | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Bouteloua breviseta - Sporobolus airoides* Herbaceous Vegetation | | P | | 4 | | NPS\_NM084 | | 1B | |  | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Ephedra torreyana / Bouteloua breviseta* Dwarf-shrub Herbaceous Vegetation | | P | | 17 | | NPS\_NM086 | | 1B | |  | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Tiquilia hispidissima / Bouteloua breviseta - Mentzelia humilis* Dwarf-shrub Herbaceous Vegetation | | E | | 7 | | CEGL004573 | | 1D | |  | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Tiquilia hispidissima / Selinocarpus lanceolatus* Dwarf-shrubland | | P | | 1 | | NPS\_NM100 | | 1C | |  | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Tiquilia hispidissima / Sporobolus nealleyi* Dwarf-shrub Herbaceous Vegetation | | E | | 13 | | CEGL001546 | | 1D | | 2B | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Atriplex canescens / Sporobolus nealleyi* GypsophilousShrubland | | P | | 29 | | NPS\_NM077 | | 1E | | 1D | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Larrea tridentata / Sporobolus nealleyi* Gypsophilous Shrubland | | P | | 1 | | NPS\_NM081 | | 1E | |  | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Poliomintha incana / Bouteloua breviseta* Gypsophilous Shrubland | | P | | 7 | | NPS\_NM087 | | 1A | |  | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Poliomintha incana / Muhlenbergia pungens* Gypsophilous Shrubland | | P | | 12 | | NPS\_NM089 | | 1A | |  | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Poliomintha incana* GypsumDune Shrubland | | P | | 25 | | NPS\_NM088 | | 1A | | 8A | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Rhus trilobata / Sporobolus airoides* Shrubland | | P | | 1 | | NPS\_NM090 | | 1A | |  | |
|  |  | |  | |  | |  | | |  | | | | G491 | | | Chihuahuan Sandy Plains Semi-Desert Grassland & Steppe Group | | | | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Yucca elata / Sporobolus flexuosus* Shrub Herbaceous Vegetation | | P | | 1 | | NHNM000263 | | 1B | |  | |
|  |  | |  | |  | |  | | |  | | | | G489 | | | Chihuahuan Semi-Desert Lowland Grassland Group | | | | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | | |  | | | |  | | |  | | | *Sporobolus airoides* Monotype Herbaceous Vegetation | | E | | 22 | | CEGL001688 | | 2B | |  | |
|  |  | |  | |  | | MG090 | | | North American Warm Desert Alkaline-Saline Semi-Desert Scrub | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | | |  | | | G299 | | | | Chihuahuan Lowland Basin Semi-Desert Scrub Group | | | | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | | |  | | |  | | | |  | | | *Atriplex canescens / Sporobolus airoides* Shrubland | | E | | 27 | | CEGL001291 | | 3B | |  | |
|  |  | |  | |  | |  | | |  | | |  | | | |  | | | *Flourensia cernua /* Sparse Shrubland | | P | | 1 | | NPS\_NM080 | | 3A | |  | |
|  |  | |  | |  | |  | | |  | | |  | | | |  | | | *Flourensia cernua / Sporobolus airoides* Shrubland | | E | | 2 | | CEGL001337 | | 3A | |  | |
|  |  | |  | |  | |  | | |  | | |  | | | |  | | | *Prosopis glandulosa / Sporobolus airoides* Shrubland | | E | | 14 | | CEGL001385 | | 5B | |  | |
| 6 Nonvascular & Sparse Vascular Rock Vegetation (Lithomorphic Vegetation) | | | | | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  | 6.C Semi-Desert Nonvascular & Sparse Vascular Vegetation | | | | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  | 6.C.1 Warm Semi-Desert Cliff, Scree & Rock Vegetation | | | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  |  | | 6.C.1.a North American Warm Semi-Desert Cliff, Scree & Rock Vegetation | | | | | | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  |  | |  | | MG117 | | | North American Warm Semi-Desert Cliff, Scree & Rock Vegetation | | | | | | | | | | | |  | |  | |  | |  | |  | |
|  |  |  | |  | |  | | |  | | | G569 | | | | North American Warm Semi-Desert Cliff, Scree & Rock Vegetation [Placeholder] | | | | |  | |  | |  | |  | |  | |
|  |  |  | |  | |  | | |  | | |  | | | |  | | | Sparse Vegetation / Alluivial Flat | | P | | 20 | | NPS\_NM049 | |  | |  | |
|  |  |  | |  | |  | | |  | | |  | | | |  | | | Sparse Vegetation / Dune | | P | | 5 | | NPS\_NM096 | | 8A | | 1A | |

1. **PHASE II OBJECTIVES AND TASKS**

The purpose of this project is to classify and map the vegetation of WHSA. The entire project (Phases II – IV) is designed to take three years. The mapping will use a combination of image analysis and digital aerial photo interpretation with the intent of increasing efficiency and accuracy. Table 2 shows the time allocation and budget, and Table 3 shows the schedule for each of the tasks. The specific objectives and tasks for Phase II are:

**Task 1. Project Scoping and Project Management.** Conduct a Phase II scoping with WHSA, CHDN network personnel and others to: 1) evaluate the vegetation classification and preliminary working map with respect to legend content, level of detail; and imagery; 2) coordinate logistics for supplemental sampling field season; 3) gather relevant literature and supplemental vegetation data to support the mapping and report writing, and 4) detail the work flow for the final report.

**Task 2. Draft Final Vegetation Map.**

Using the preliminary working map from Phase I, GIS staff will conduct a detailed edit of map delineations and evaluation of map units leading to the production of a Draft Final Vegetation Map. The coordinator will prepare a sampling plan to gather additional ground control points to address the needs identified in the editing and evaluation process.

**Task 3. Supplemental Mapping Ground Control: field sampling effort.** A two-week sampling effort will be conducted to gather targeted ground control points identified in Task 2. Plots will be streamlined mapping points that provide sufficient information on the abundance of dominant species and site characteristics to classify the sampled vegetation to the plant association level of the NVCS. The plots will be used to revise the Draft Vegetation Map (see Task 5). Field verification of the dichotomous key will also be conducted.

**Task 4. Plant Voucher ID/Plot Data Entry and Classification.** All voucher specimens will be identified to the lowest rank possible, and ready them for accession into the Museum of Southwestern Biology Herbarium (voucher specimens are expected to be minimal during Phase II). The cooperator will enter all corrected field data into a relational database in form compatible with the most current version of NPS PLOTS. As part of the process, plots will be classified to the plant association level of NVCS to be used in Task 5.

**Task 5. Final Vegetation Map Development.** The vegetation map will be revised based on the field campaign data and a final vegetation map developed. It will be targeted to be used at a scale of 1:24,000 with a minimum mapping unit delineation size of 0.5 ha. For the cartographic base, a standard NPS standard template for vegetation maps will be used. The map will be made available as part of a transportable ArcGIS Geodatabase, and as a poster digital file with a 600 PPI resolution (for direct printing by NPS).

**Task 6. Database and Other Ancillary Project Products.**  The cooperator will deliver plot data in most current version of the NPS PLOTS Microsoft Access relational database and the spatial data as an ArcGIS geodatabase (version 10.x). Additional deliverables will include digital plot photos, data sheets and two hard copies of poster-sized vegetation map (one for the park and one for CHDN).

1. **Statement of Work**

The period of performance is from the date of final signature through November 30, 2015.

**NPS agrees to:**

1. *Assign the CHDN Data Manager to assist with data management.*
2. *Assign the CHDN Science Advisor to coordinate input and interactions between NHNM, other cooperators, and the point of contact (POC) at the park.*
3. *Ensure NHNM field crews are properly trained.*
4. *Collaborate on a final field sampling plan (agreed to by park and NHNM) that will include necessary GIS spatial layers and spreadsheet of sampling points.*
5. *Through the CHDN staff, will regularly communicate with the PI on the planned work schedule and project goals.*
6. *Through the park staff, will regularly communicate with the PI on routine day-to-day logistically requirements, safety issues and other similar elements.*
7. *Assist the PI in acquiring permits and addressing National Environmental Policy Act (NEPA) and/or the National Historic Preservation Act (NHPA) compliance prior to any field-data collection.*
8. *In conjunction with the project, CHDN and WHSA will support field crews, where possible and necessary, in the collection of field data within WHSA.*
9. *Ensure and provide (if necessary) sampling protocols, and the PLOTS database for entering field data.*
10. *As necessary, WHSA will provide logistical support (UTVs) for moving field crews into roadless areas of the park) to ensure completion of data collection.*
11. *WHSA will provide no-cost in-park housing for the field crew (2-persons). Housing will be provided when available.*
12. *WHSA, when possible may provide access during normal business hours to a desk or table space and electrical outlets to complete routine office work, data entry or plant identification (if not staying at park research housing).*
13. *Where possible, WHSA and CHDN will facilitate and participate in project field site visits for completing field data collection.*
14. *CHDN will provide periodic review of field data and make recommendations on quality control. Perform final quality check and data certification of the PLOTS database.*
15. *Identify mandatory procedures for data management of all hard copy data, voucher specimens, and digital data (including the PLOTS database, digital images and GPS data).*
16. *Provide the necessary metadata application development tools, training in their use, and guidance as needed.*
17. *CHDN and WHSA will work with NHNM to ensure NPS guidelines for collecting voucher specimens and all collection information accompanies each voucher specimen. CHDN staff will be responsible for mounting and labeling voucher specimens, and if necessary may assist with plant identification of unknown specimens.*
18. *Inform the PI of the specific activities required to comply with the “NPS Interim Guidance Document Governing Code of Conduct, Peer Review, and Information quality Correction for National Park service Cultural and Natural Resource Disciplines” and any and all subsequent guidance issued by the NPS Director to replace this interim document.*
19. *NPS will review all reporting products (monthly updates, quarterly progress statements and draft and final reports), as well as other deliverables (images, vegetation map and PLOTS database).*
20. *Fully acknowledge the NHNM in any published or formally presented material developed or derived from this Task Agreement.*
21. *Collaborate with the NHNM, as appropriate, in a sixty-day wrap-up period following the due date of the last project product.*

**The Cooperator agrees to:**

* 1. *Hire qualified staff to collect field data, enter the field data and ensure acceptable quality assurance and quality control standards.*
  2. *Obtain all necessary permits and address compliance issues to conduct work at parks. Comply with park regulations.*
  3. *Provide and/or arrange equipment, transportation, housing, and other logistical support for field crews, including computers for data entry.*
  4. *With guidance from CHDN staff, NHNM will direct, supervise and support field crews in the collection of field data at WHSA.*
  5. *Based upon guidance from the CHDN Data Manager and the NPS’s National Vegetation Mapping Program, NHNM will develop and integrate data management into the processing of all hard copy, tabular, and geospatial data/information, such as classification, observation data, digital images, and GPS data.*
  6. *Collect 2 vouchers for each unknown plant species, or plants not previously known to occur in the park. Any voucher specimens of herbarium quality for deposition shall be accessioned in the University of New Mexico’s Natural Heritage Program herbarium, as well as provide copies of vouchered specimens to CHDN (if necessary). CHDN will be responsible for preparing any vouchers to be included in their herbarium. At the conclusion of the final field season, voucher specimens not included in the network’ or university’s herbarium will be destroyed and discarded.*
  7. *Collect and enter all project-related data in compliance with 1) the NVMP’s sampling protocols for vegetation classification field data collection and 2) the network’s Standard Operating Procedures (SOP) related to project deliverables (e.g. geospatial and tabular datasets, digital images, field data sheets, maps, notes, and plant voucher specimens).*
  8. *Provide the CHDN with all products in formats specified by the CHDN. Products include original hard copy data sheets, scanned (pdf) versions of the data sheets, the digital PLOTS database, digital images, GPS data, reports, and metadata for all digital files.*
  9. *Acquire appropriate NPS permits from WHSA and submit Investigator’s Annual Report (IAR) for submission to NPS prior to the March 31 deadline following the year the permit was issued. IAR’s (1-2 paragraphs) are submitted online to meet the requirement of NPS permits.*
  10. *Prepare monthly updates (bullet statements or very brief text of less than ½ page), quarterly progress statements (2 pages or less), and final reports for submission to the NPS.*
  11. *Cooperate with the Agreement Technical Representative to ensure that the conduct of the project complies with the “NPS Interim Guidance Document Governing Code of Conduct, Peer Review, and Information Quality Correction for National Park Service Cultural and Natural Resources Disciplines” and with any and all subsequent guidance issued by the NPS Director to replace this interim document.*
  12. *Fully acknowledge the NPS in any published or formally presented material developed or derived from this Task Agreement.*
  13. *Collaborate with the NPS, as appropriate, in a sixty-day wrap-up period following the due date of the last project product.*

**NPS and the Cooperator mutually agree to:**

1. *Collaboratively undertake a project titled “****A Vegetation Map for White Sands National Monument, New Mexico:Phase II”****as described in Attachment I and throughout this document.*
2. *Collaborate to develop a work plan for carrying out project objectives.*
3. *Develop a field sampling protocol manual for use by field crews, if mutually determined to be appropriate.*

**Table 3. Gantt chart of phase II project schedule, White Sands National Monument Vegetation Map.**



**COOPERATIVE AGREEMENTS OR TASK AGREEMENTS INVOLVING COOPERATORS WORKING ON-SITE**

**Background**

In cooperative agreements or task agreements with universities where the university utilizes interns, student employees, research associates (RAs) or cooperators on-site (hereafter called “cooperator personnel”), these cooperator personnel sometimes work on government sites in close proximity to federal employees. It is illegal (without specific statutory authority) for federal employees to directly supervise the cooperator personnel or any university employees or for the students or other university employees to supervise federal employees. When cooperator personnel are working on an NPS site, it is important that there is a clear distinction between students and federal employees.

**Office Environment and Vehicles**

* The office space of the cooperator personnel and NPS personnel should be clearly labeled (Name and NPS or University affiliation on office or cubicle space).
* Cooperator personnel should be listed separately from NPS personnel in telephone lists, other identification or organizational rosters, and publication credits.
* Cooperator personnel should not receive “all-employee” e-mail or other communications intended for NPS personnel (unless it relates directly to the work the cooperator is doing for the NPS). When the e-mail does relate to the work being done, a copy of the same e-mail message should be sent to the University or cooperator’s supervisor.
* Cooperator personnel may use NPS e-mail systems when the communication relates directly to the work the cooperator is doing for the NPS. The e-mail addresses of the cooperator personnel must include a label associated with their NPS e-mail address that identifies the cooperator’s status (i.e., “Linda Webb, Cooperator” would be the label associated with the e-mail address, [linda\_webb@contractor.nps.gov](mailto:linda_webb@contractor.nps.gov)). Doing so clearly identifies this individual each time they send an e-mail message using the NPS system, and it identifies their status as a research associate, student intern or student employee in the e-mail directory.
* Unless stipulated in the agreement, cooperator personnel should not drive government vehicles.
* Unless stipulated in the agreement, cooperator personnel should not ride as a passenger in a government vehicle. When this is planned as part of the agreement, an appropriate amount of liability insurance should be negotiated.
* Prior written approval by the Park Superintendent or Center Manager must be obtained in order for a task to allow cooperator personnel to drive or ride in government vehicles.

**Supervision and Scheduling**

* Each task must specify the university’s/cooperator’s supervisor for the cooperator personnel.
* Unless stipulated in the agreement, NPS staff should not set hours for cooperator personnel, specify where the work should be done, or conduct performance appraisals. National Park Service staff may give performance feedback to the cooperator personnel supervisor.
* Cooperator personnel should report leave, scheduling, and other related issues to the university or cooperator’s supervisor, not to NPS employees. The supervisor of the cooperator personnel should then communicate with the NPS. National Park Service employees cannot directly supervise cooperator personnel on a day-to-day basis. Work should be given to the cooperator personnel (via the cooperator’s supervisor) on a “task basis.” Cooperators should work without NPS supervision to accomplish each task, although technical consultations and cooperation is permissible.
* The Cooperator will be responsible for any disciplinary action needed to correct student employee conduct or performance problems. The NPS agreements technical representative will inform the university/cooperator’s supervisor of any conduct or performance problems.
* The Cooperator will remove student employees from their positions if they fail to improve performance or address conduct issues.
* The NPS will review and provide feedback to students or interns regarding work assignments.
* The NPS will inform the cooperator of conduct or performance problems with cooperator personnel so that the university can counsel employees and correct the performance problems.
* The NPS will recommend to the cooperator dismissal of cooperator personnel based on conduct or performance issues.
* The Cooperator will hire students, interns or RAs to work on NPS tasks identified in the agreement. Hiring will be conducted in consultation with the NPS Agreements Technical Representative (ATR).
* The Cooperator will: pay students, interns or RAs for hours they have worked in support of the agreement.

**Representation and Communication**

* Cooperator personnel cannot in any way represent themselves to the public as NPS employees.
* Cooperator personnel are required to wear visible identification at all times.

**Other Issues**

* Cooperator personnel should not list an NPS affiliation on publications, but rather should list the cooperative agreement under which the work was performed.
* Cooperator personnel should not be invited to official NPS “social” events.
* Cooperator personnel will follow the local policy of the facility when federal facilities are closed due to early release for holidays, snow days, etc.

**PRODUCTS:**

**1. Monthly updates (bullet statements or < ½ page of text) for inclusion in the CHDN’s monthly update to their Technical Committee and Board of Directors.**

**2. Quarterly progress statements (less than 2 pages)**

**3. Draft vegetation classification map (digital and hard copy, 1 for park and 1 for CHDN)**

**4. Dichotomous plant key**

**5. PLOTS database**

**6. All associated GIS data, images, voucher data and specimens (as appropriate)**

**7. Draft report (typically Chapters 1 & 2, and associated tables and appendixes).**

**BUDGET:**Budget is a separate document (spreadsheet).