Heber Dunes State Vehicular Recreation Area

2022 Wildlife Habitat Protection Plan (WHPP)

Prepared by:

California Department of Parks and Recreation
Off-Highway Motor Vehicle Recreation Division and Natural Resources Division
Ocotillo Wells District

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LIST OF FREQUENTLY USED ACRONYMS

BAS	Best Available Science
CARB	California Air Resources Board
CDFW [formerly CDFG]	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
EDRR	Early Detection Rapid Response
HDSVRA	Heber Dunes State Vehicular Recreation Area
HU	Hydrologic Unit
ICAPCD	Imperial County Air Pollution Control District
IID	Imperial Irrigation District
MU	Management Unit
NAAQS	National Ambient Air Quality Standard
NDVI	Normalized Difference Vegetation Index
OHMVRD	Off-Highway Motor Vehicle Recreation Division
OHV	Off-Highway Vehicle
PM_{10}	Particulate Matter Less Than 10 Microns in Diameter
PRC	Public Resources Code
SB	Senate Bill
SCP	Soil Conservation Plan
SDG&E	San Diego Gas and Electric
SDSU	San Diego State University
SIP	Statewide Implementation Plan
SSAB	Salton Sea Air Basin
SSC	California Species of Special Concern
SVRA	State Vehicular Recreation Area
VegCAMP	Vegetation Classification and Mapping Program
WHPP	Wildlife Habitat Protection Plan

1 INTRODUCTION

Heber Dunes State Vehicular Recreation Area (HDSVRA, SVRA or park) offers 341 acres for off-highway vehicle (OHV) recreation in Imperial County. The California Department of Parks and Recreation (Department or State Parks) manages Heber Dunes SVRA in accordance with California Public Resources Code (PRC) §5090 and department policies, as defined in the Department Operations Manual. The PRC requires the Off-Highway Motor Vehicle Recreation Division (OHMVRD or the Division) to prepare a wildlife habitat protection plan (WHPP) for each SVRA. The 2022 WHPP replaces the existing Heber Dunes SVRA WHPP adopted in 2001.

1.1 PURPOSE AND SCOPE OF A 2022 WHPP

A WHPP acts as a dynamic working document that provides land managers with guidance for managing habitat, along with short- and long-term habitat goals and the methods to achieve these goals. The 2022 WHPP utilizes scientific literature, expert opinion, and staff expertise in setting goals and describing land management activities. The scope of a WHPP encompasses the full spectrum of land management and visitor use activities that affect wildlife habitat at a SVRA. It includes existing settings, goals, all management actions, and a plan for why and when management actions are implemented, among other items.

1.2 LEGAL AND OPERATIONAL REQUIREMENTS

Since 1988, the PRC has required a Wildlife Habitat Protection Program for each SVRA that focused on sustaining a viable species composition. In 2017, Senate Bill (SB) 249 amended the PRC to require that a WHPP that conserves and improves wildlife habitats be developed for each SVRA. Senate Bill (SB) 249 added other specific requirements, including that WHPPs consider statutorily required state and regional conservation objectives, apply best available science (BAS), and annual monitoring to ensure WHPP objectives are being met.

1.3 RELATIONSHIP WITH OTHER HEBER DUNES SVRA PLANS

A WHPP is only one of several planning documents used at State Parks, so it must relate to and complement other park plans (Figure 1). Heber Dunes SVRA has a limited number of planning documents. In late 2011, a general plan was approved for Heber Dunes that guides the management for all aspects of the SVRA. A Soil Conservation Plan (SCP) is being developed with anticipated completion in early 2022. The SCP will address compliance with the 2020 Soil Conservation Standard and address unit-wide assessment, maintenance, and monitoring actions related to OHV facility management. While the SCP and WHPP focus on different resources, there is overlap between the two documents, and they were designed to be complementary. A Dust Control Plan was developed in 2013 (Tetra Tech 2013) for the park unit and was subsequently updated in 2017 (CDPR 2017). An update is anticipated in late 2022. The

Dust Control Plan has limited relevance to the WHPP but is discussed in greater detail in the SCP.

State Park General Plans are comprehensive, goal-oriented plans that serve as the primary management documents for park units within the California State Parks System. A general plan is expected to stand for at least 20 years to provide a consistent vision while providing flexibility for replying to changing conditions. In 2011, the first General Plan was developed for Heber Dunes SVRA, providing a vision and guide for the long-term management of the park and its resources. The goals of this General Plan focus on providing an enjoyable recreational experience, enhancing OHV recreational opportunities, and protecting the SVRA's resources, including plants, wildlife, and cultural resources.

For further details on the park facilities and operations, see the 2011 Heber Dunes General Plan.

Figure 1. The WHPP is a type of Management Plan under the State Parks' Park Planning Structure.

1.4 California Environmental Quality Act Compliance

As a part of this process, the WHPP identifies resource objectives and general types of projects and/or actions that can or will be taken to ensure progress on meeting the WHPP objectives. The California Environmental Quality Act (CEQA) process begins at this stage. State Parks will follow Department procedures for meeting CEQA compliance if discretionary projects or actions

are identified. Once a project or action has been selected for implementation, it will undergo CEQA review at that time using the State Parks Project Evaluation Form.

1.5 Update Cycle

WHPP updates will generally occur every five years and forecast wildlife habitat protection and restoration planning in the SVRA over the next five years. Updates will include a summary of wildlife habitat protection and conservation at the SVRA since the previous WHPP revision and a description of the goals and objectives for the next five years. The update will reflect changes to landcover, land use, species occurrence, disturbance, land acquisitions, and updates to monitoring protocols or technology. The Department's Natural Resource Division (NRD) will review the WHPP to ensure BAS was applied, followed by approval by the OHMVRD. If CEQA review is deemed necessary, it will be completed at that time.

1.6 Adaptive Management

Adaptive management is a common strategy and fundamental component of implementing BAS in natural resource management. With the passage of SB 249, Section (§) 5090.14 was added to the PRC to provide additional guidance on the use of adaptive management within State Parks' OHMVRD:

> *"Adaptive management" means to use the results of information gathered through a monitoring program or scientific research to adjust management strategies and practices to conserve cultural resources and provide for the conservation and improvement of natural resources.*

This addition to PRC §5090 defined adaptive management as the foundation and guiding force behind SVRA monitoring programs and an integral part of updating the WHPP. An adaptive management loop for a WHPP includes assessing park resources, objectives based on those conditions, targeted management actions to meet objectives, monitoring to evaluate the success of management actions, and determining necessary adjustments. The Heber Dunes WHPP will define the adaptive management approach that guides resource management in the SVRA.

2 SVRA Setting and Natural Resource Assessment

2.1 Location and Regional Context

Heber Dunes SVRA is located in an unincorporated area of Imperial County, approximately six miles south of the town of Holtville (Figure 2). Imperial County is primarily a rural, agricultural region. The SVRA is accessible by regional transportation routes such as Interstate 8 (I-8) and State Route 7 (SR-7). The greater San Diego and Palm Desert areas are approximately 125 miles

west and northwest. Agricultural land with an intricate series of canals providing irrigation water for cropland surrounds the SVRA. Calexico, El Centro, Holtville, Imperial, Heber, and Mexicali are within short driving distance of the park (10 miles), and the international border with Mexico is approximately 2.5 miles south of Heber Dunes SVRA.

2.1.1 Regional Land Use

Heber Dunes SVRA is surrounded by agricultural fields (Figure 3) and bounded to the north by Heber Road. The South Alamo Canal forms most of the southern and eastern boundaries of Heber Dunes SVRA. The canal traverses north and south along the entire eastern site boundary of Heber Dunes SVRA and forms a portion of the southern boundary. Immediately east of and adjacent to the canal is a 306-acre undeveloped parcel of land purchased by the California Department of Transportation (Caltrans) for mitigation purposes associated with previous improvements to SR-7. Agricultural fields lie west of the SVRA, and a few residential homes within agricultural fields are located within one-half mile of the SVRA.

Multiple easements cross Heber Dunes SVRA boundaries related to power transmission and irrigation canal access. Imperial Irrigation District (IID) supplies water to the Heber Dunes SVRA park office and has water conveyance structures in the park's vicinity. IID also manages the Alamo Canal. San Diego Gas and Electric (SDG&E) has three transmission towers that bisect Heber Dunes SVRA, carrying high-voltage 500-kilovolt overhead electric lines across the park. SDG&E has a 200-foot-wide easement that follows the electric lines through the SVRA. These facilities are maintained by their associated entities and do not prohibit OHV recreation.

2.1.2 Relevant SVRA and Regional History

Heber Dunes SVRA falls within the traditional territory of the Kumeyaay. The Kumeyaay settled primarily along the New and Alamo Rivers (Kirkish et al., 2000) through the early 19th century, when traditional use of the area declined due to increased European settlement. The Kumeyaay were gatherers, living off the land and supplementing their diet with floodplain horticulture along rivers and springs (Underwood and Gregory, 2006).

In the late 18th century, Spanish exploration and settlement began in what would become eastern San Diego and Imperial Counties. Mexican settlers began to enter the area after California came under Mexican rule in 1821. Anglo-European contact precipitated the spread of cattle grazing and agriculture throughout the region. The development of a water conveyance system for agriculture and residential development in the early 20th century facilitated agricultural development and associated population growth.

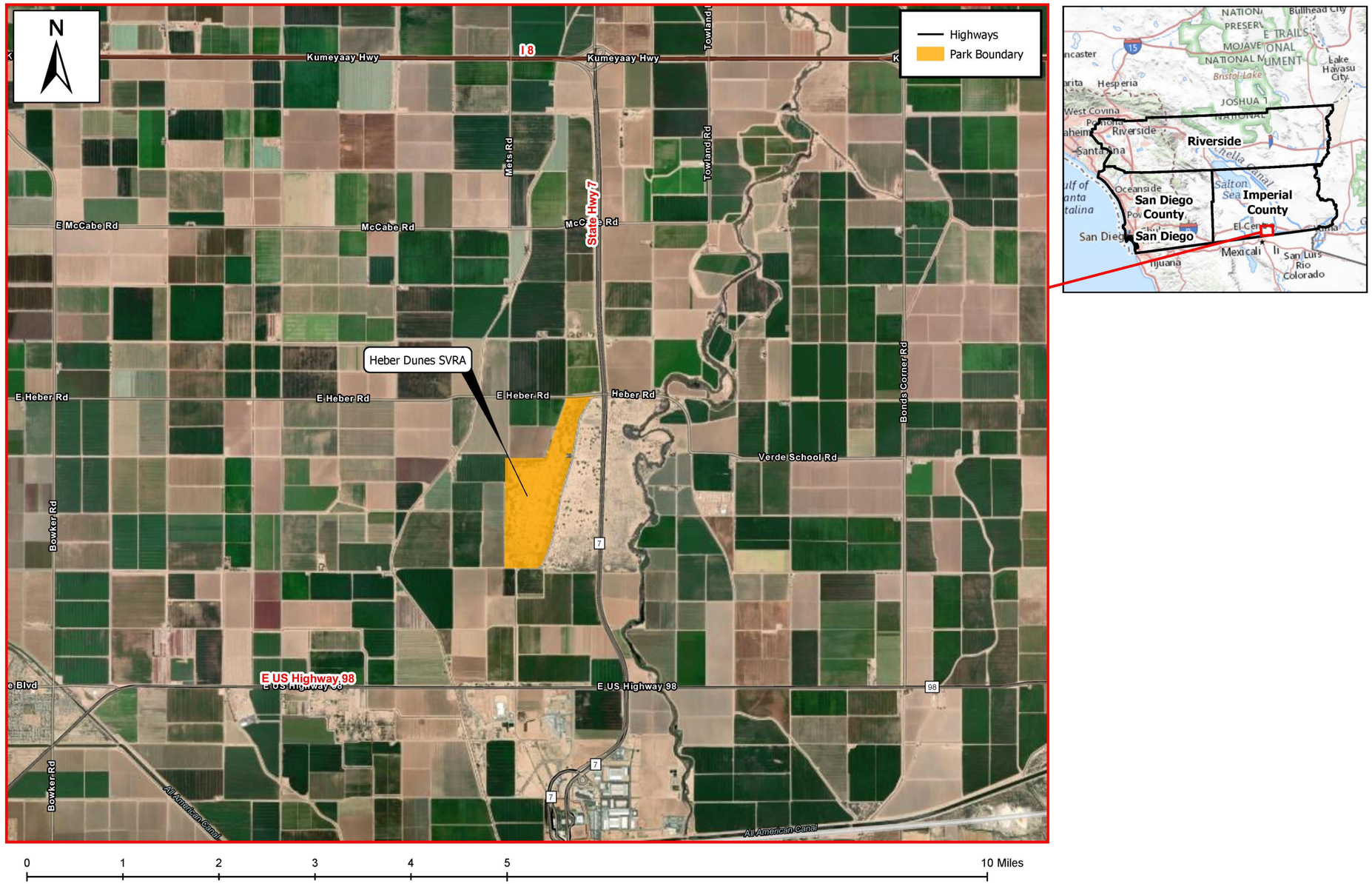

Figure 2. Regional location of Heber Dunes SVRA.

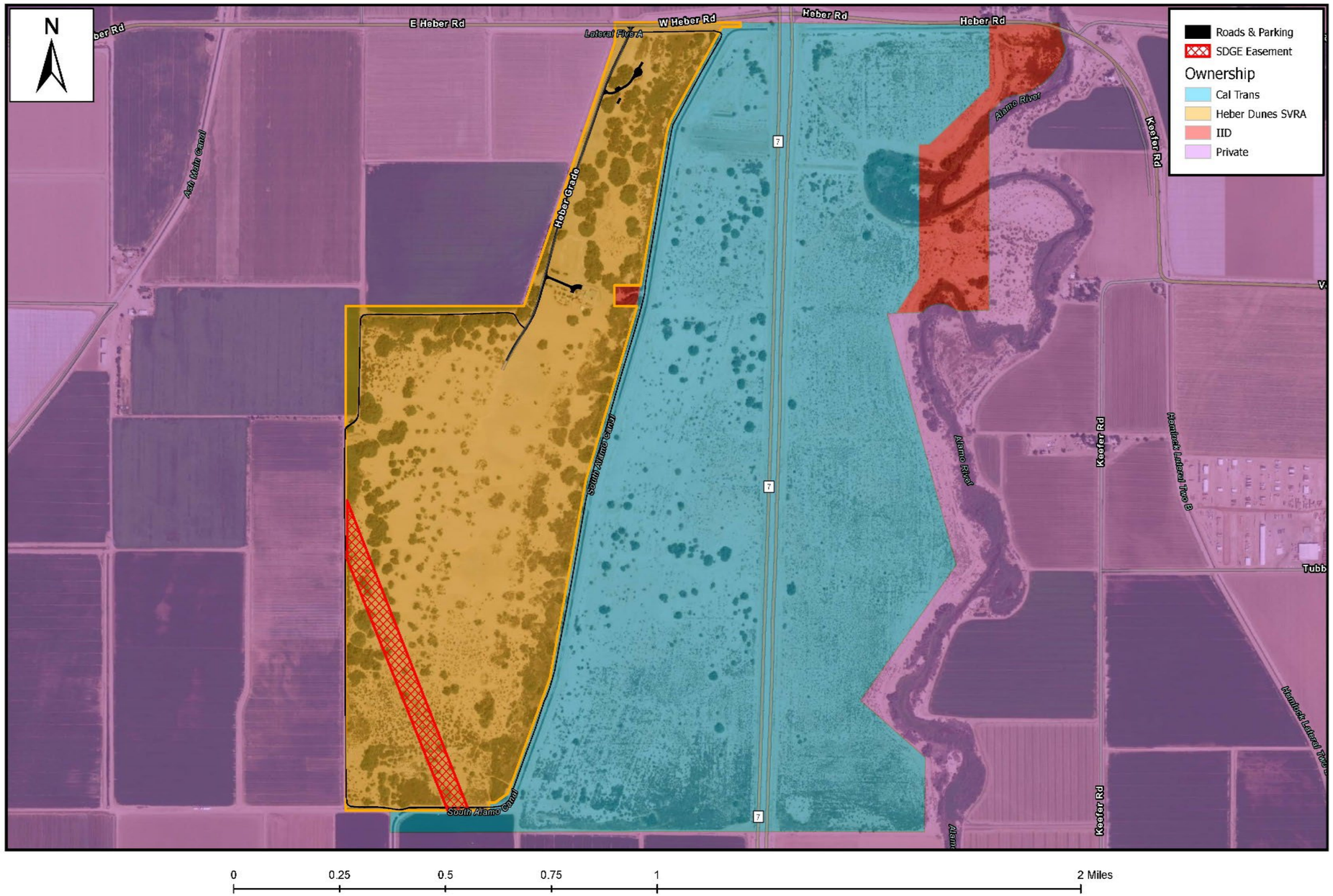

Figure 3. Regional land use at Heber Dunes SVRA.

The dunes located within Heber Dunes SVRA were part of a much more extensive dune network before being graded in 1905 to construct irrigation canals (Craft, personal communication, 1998). Although little recorded history is available about the Heber Dunes property, oral interviews with long-time residents have provided some information. Residents refer to the area as “Heber Beach” in reference to the consistent presence of water next to the dunes, although there are differing stories about how this name originated.

Before the OHMVRD managed Heber Dunes as a SVRA, Imperial County operated the area as an OHV facility for more than 30 years. In 1998, the OHMVRD entered into a lease with the County to assume responsibility for park operations. Heber Dunes was officially deeded to the OHMVRD in 2007 and was subsequently classified as a SVRA.

Today, Heber Dunes SVRA offers a unique recreation opportunity in Imperial County. It is located within several miles of Imperial County population centers and provides a good opportunity for novice riders to gain experience. Due to the relatively low dunes, limited day-use hours, and small park size, most visitation occurs from the local area. In addition to OHV recreation, the park is also popular as a gathering place for barbeques and picnics.

2.2 SVRA OPERATIONS

2.2.1 SVRA Operations

Heber Dunes SVRA is part of the Ocotillo Wells District (District). The Ocotillo Wells District manages four other park units (Figure 4). These units include Ocotillo Wells SVRA, Picacho State Recreation Area (SRA), Salton Sea SRA, and Indio Hills Palms, which is an unclassified unit that is managed as part of the Coachella Valley Preserve. The district headquarters is located at Ocotillo Wells SVRA, approximately an hour away from the park.

The park has limited dedicated staff, including a Park Maintenance Worker I, Interpreter I (Permanent Intermittent), State Park Peace Officer, and seasonal staff hired as needed. There is no dedicated permanent or seasonal resource staff located at the SVRA. District staff offers support as needed, including resource protection and maintenance support.

2.2.2 Facilities

Heber Dunes SVRA is largely undeveloped with limited infrastructure and improvements. Much of the park comprises dunes and vegetation, with a network of trails and perimeter roads (Figure 5). The park unit is zoned for open riding, although the General Plan indicates that the southwestern portion of the SVRA could be operated as trails only. A small, developed area in the north-central site off Heber Dunes Road includes administrative and maintenance buildings, a visitor restroom and shower facility, a large picnic area, and a dirt track for young OHV riders. A water treatment plant is located in the maintenance yard. A camp host area with a residence

and two concrete pads are in the facility's northern portion. A dozen shade ramadas are scattered in the center of the facility and one unloading ramp for OHVs.

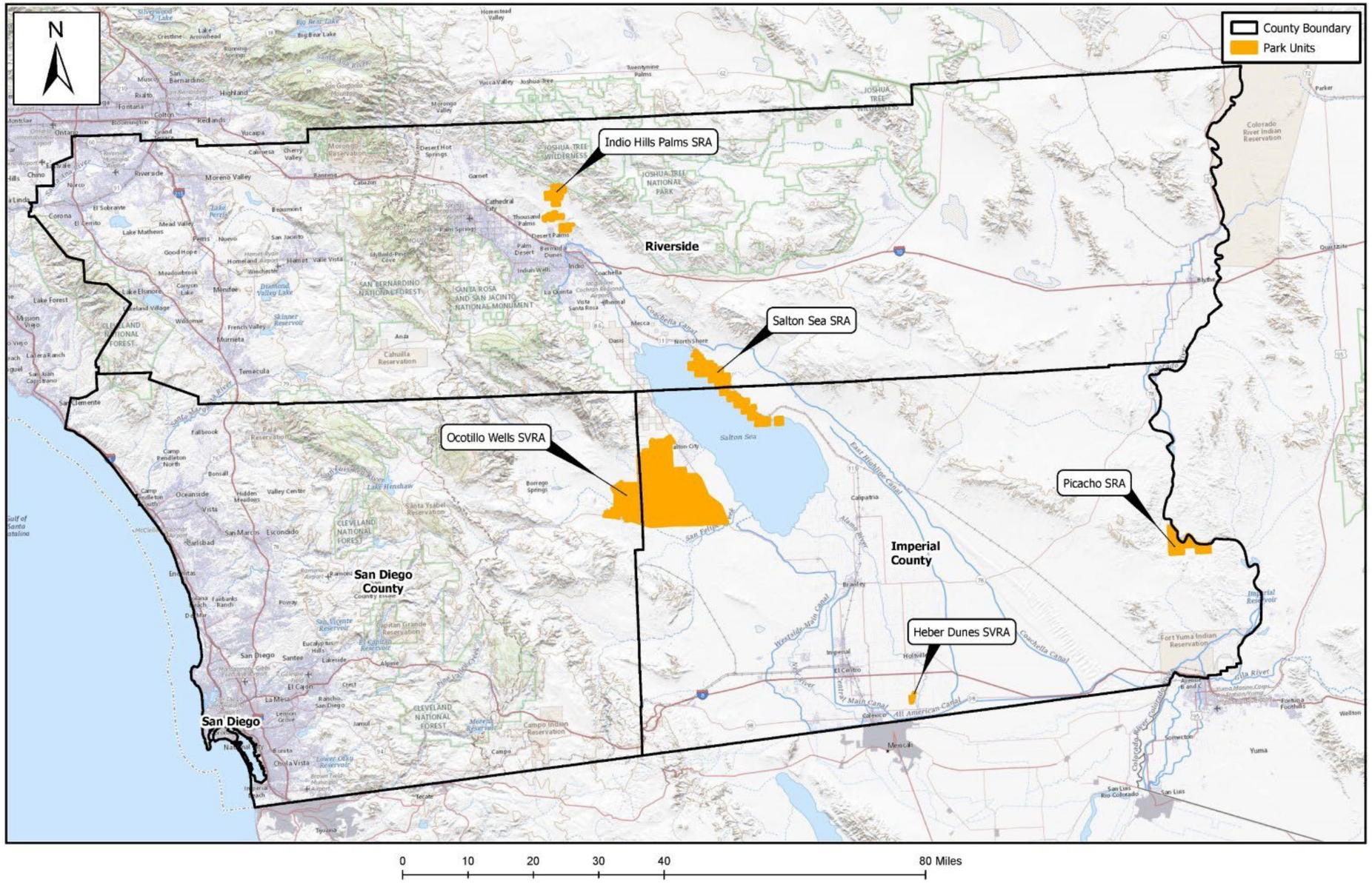

Figure 4. Park units in the Ocotillo Wells District.

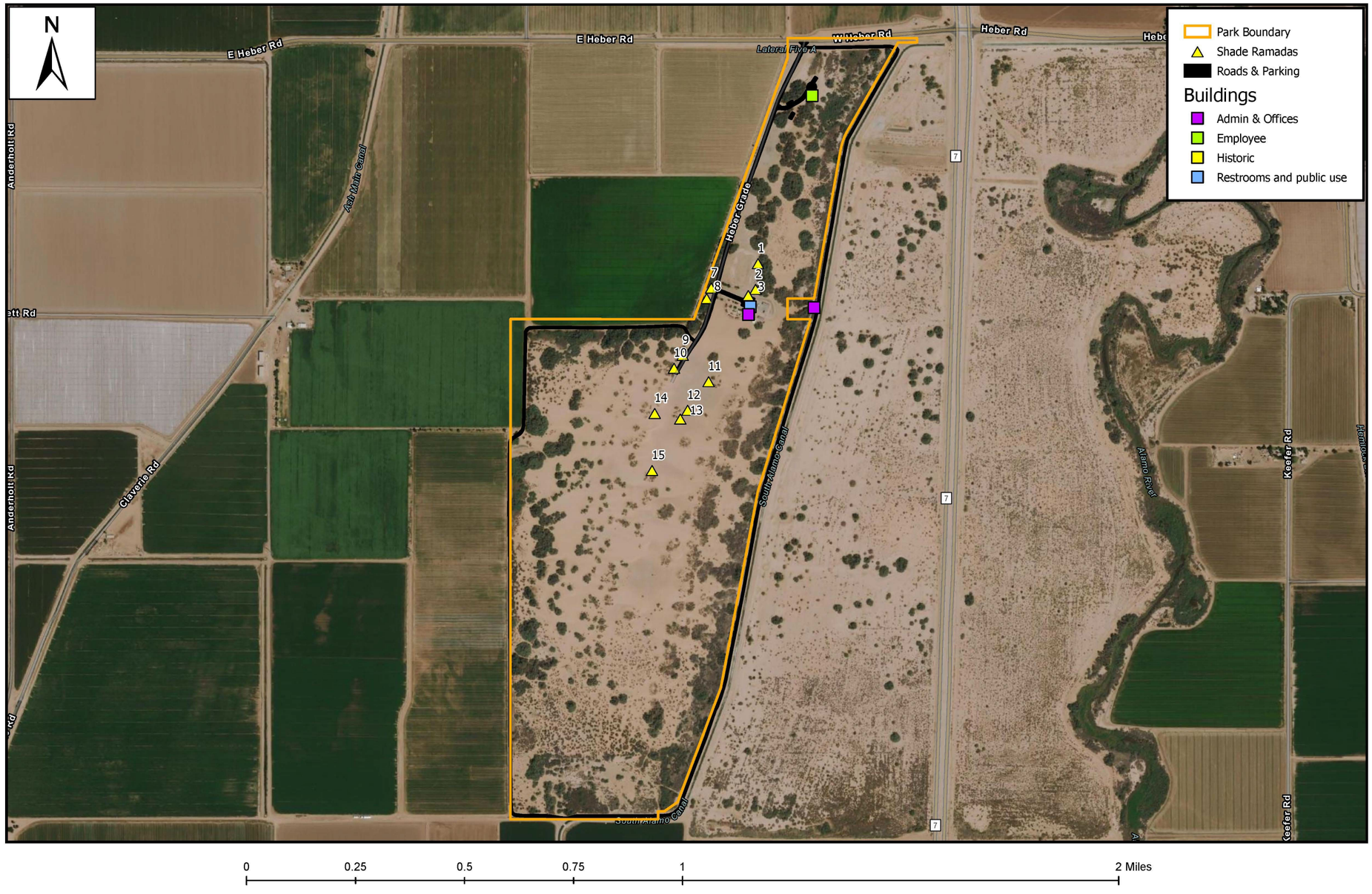

Figure 5. Day use and administrative facilities are located at Heber Dunes SVRA.

Aside from the SVRA's paved entrance road, Heber Dunes Road, and an unnamed dirt perimeter road, there are no designated trails in the SVRA. However, there are well-established user-created routes of travel, referred to as social or volunteer trails, throughout the unit. A pump house is located on IID property on the eastern portion of the SVRA, used for water delivery operations for the park. SDG&E has three transmission towers that run diagonally through Heber Dunes SVRA, starting in the southeastern corner.

There are some discrepancies in the park boundary between the county and State Parks datasets. Based on a survey performed by State Park's survey team, the unit boundary extends into an agricultural field, while the county's parcel data does not extend into the agricultural field. For the purposes of management and this document, the State Parks survey data has been used for maps. The boundary is of minimal management concern at this time, and any resolution would be beyond the scope of the WHPP.

2.2.3 Visitation and Use Levels

Heber Dunes SVRA's terrain offers OHV recreation for beginner and intermediate OHV enthusiasts. It does not have features that allow for more advanced OHV recreational opportunities. All-terrain vehicles (ATVs), also known as quads, are the predominant type of OHV used by recreationists at the SVRA. Larger four-wheel-drive vehicles and motorcycles designed for trails (dirt bikes) are also used.

Since Heber Dunes SVRA is open only for day-use, visitors tend to be from neighboring communities. Typically, weekend visitation is higher than weekday use. Overall, visitation varies by season, with the highest levels occurring between fall and early spring. Visitation is significantly lower during the late spring and summer when temperatures are considerably higher. Annual visitation is estimated at 13,000 vehicles with a total attendance of around 35,000 (Erickson et al., 2014).

Visitors gather in shaded areas, including ramadas, under trees, with family and friends in small to large groups (five to ten individuals). Besides OHV recreation, socializing, picnicking, barbecuing, watching OHV recreation, and viewing scenery are popular activities.

Most visitors drive street-legal vehicles into Heber Dunes SVRA with OHVs in trailers or the bed of pick-up trucks. Visitors typically park their street-legal vehicles at picnic tables. Informal parking at day-use sites tends to be preferred by visitors so that they can access supplies in their vehicles throughout the day.

2.3 ABIOTIC ENVIRONMENTAL FACTORS

2.3.1 Geology and Soils

Heber Dunes SVRA is in the Imperial Valley, part of the Salton Trough, a structural and topographic depression within the Colorado Desert geomorphic province. The Salton Trough marks the northern extent of tectonic plate rifting that created the Gulf of California. Over the millennia, the Colorado River has periodically meandered to the Salton Trough, filling it to create iterative versions of ancient Lake Cahuilla before reestablishing its path to the north end of the Gulf of California.

In repeatedly filling the Salton Trough depression, the Colorado river deposited its nutrient-rich fluvial soils onto the submerged desert floor. The soils of the Imperial Valley owe their fertility and productivity to this past wandering quirk of the Colorado River. Sands and silts deposited into Lake Cahuilla by the Colorado River were exposed to prevailing westerly winds when Lake Cahuilla dried. The sediments accumulated based on the regional wind patterns and silt from deposition, eventually creating the dunes that would become the Heber Dunes SVRA and the much larger Algodones Dunes found along the eastern edge of the Imperial Valley.

The agricultural production potential of the Lake Cahuilla soils in their present desert setting was recognized in the latter portion of the 19th century, as the country was expanding westward. Engineering attempts to more modestly divert Colorado River water to irrigate the soils of the Salton Trough began at the turn of the twentieth century. Repeated levee failures related to these early attempts caused the Colorado River to flow once again unchecked into the Salton Trough for about two years. Massive amounts of rock were repeatedly dumped into the levee breach, but it wasn't until 1907, when the Southern Pacific Railroad Company joined the effort, that the breach was closed. By that time, the Salton Sea had formed, a more modest but still massive, modern-day equivalent of ancient Lake Cahuilla.

The Salton Trough is bordered on the west and southwest by low-lying mountains comprised of deformed marine and non-marine sediments overlying older igneous and metamorphic units. Numerous active faults within the Salton Trough suggest the area is part of a depressed block at the northern end of crustal rifting caused by seafloor spreading that is still widening the Gulf of California to the south. As the trough continues to sink over time, uplift occurs in the surrounding areas, resulting in the tilting of the sedimentary deposits. As a result of activity associated primarily with the San Andreas Fault System east of the Salton Sea and the San Jacinto Fault System, the SVRA and region are subject to earthquakes. Related geothermal features, such as hot springs, are found along these fault traces, and commercial energy production from the regional geothermal activity is ongoing.

Geologic maps show the region underlain by Quaternary lake deposits and alluvium (Strand, 1962). Quaternary dunes are mapped on the property. The Imperial Fault crosses the property

from southeast to northwest (Kahle et al., 1984; Real et al., 1979). A 1937 aerial photograph (Youd and Wieczorek, 1982) shows that the property's area was predominantly covered with dunes with a stream channel to the west of Heber Dunes SVRA. The overall large size of the dune substrate at Heber Dunes SVRA precluded its development for agriculture, unlike many of the smaller dune areas throughout the Salton Trough, which were easier to remove or level for other uses.

Today, Heber Dunes SVRA consists of dunes and areas of claypan soils (Figure 6). The dunes are as high as 50 feet, but most are 25 feet high and lower. A county-wide soil survey indicates six soil types exist at Heber Dunes SVRA. The majority of Heber Dunes SVRA, 83 percent, comprises Rositas fine sand (284 acres). Other on-site soil types are Meloland and Holtville loams (21 acres), Vint loamy very fine sand (13 acres), Meloland very fine sandy loam (12 acres), Vint and Indio very fine sandy loams (9 acres), and Indio loam (1 acre).

The entire southern California region is a seismically active area with multiple fault lines, and Imperial County has high seismic activity. Most of the seismic activity is in the Salton Trough, and, consequently, the valley is subject to potentially destructive and devastating earthquakes. Several regional faults are quite active in the Salton Basin, including the San Andreas Fault and the San Jacinto Fault. Numerous other faults are near the SVRA, including the Imperial and Brawley faults. Rupture and/or ground distress has been noted at the South Alamo Canal and on the property, along Heber Road, following the 1979 Imperial Valley Earthquake (Wright Environmental Services, 2009).

2.3.2 Climate

Heber Dunes SVRA is in the Imperial Valley, in Imperial County, just north of the border between the United States and Mexico. Imperial County is contained within the Salton Sea Air Basin (SSAB)(Figure 7). The climate is typical of a desert with low annual precipitation (2.61 inches annual average, mostly in late summer or mid-winter), very hot summers, mild winters, high evaporation rates, and strong temperature differentials and inversions.

One of the main determinants of climatology in the SSAB is a semipermanent high-pressure area (the Pacific High) over the Pacific Ocean. The Pacific High is located well to the north in the summer, directing storm tracks north of California and maintaining clear skies for much of the year. When the Pacific High moves southward during the winter, weakened low-pressure storms and the mountains to the north bring little rainfall. The combination of subsiding air pressure, surrounding mountain barriers, and sufficient distance from the cold waters of the Pacific Ocean severely limit precipitation in Imperial County.

Heber Dunes SVRA receives three inches of rainfall on average annually. Precipitation over the entire area occurs mostly from November through April and August through September, but its distribution and intensity are often sporadic. Local thunderstorms may contribute to all the

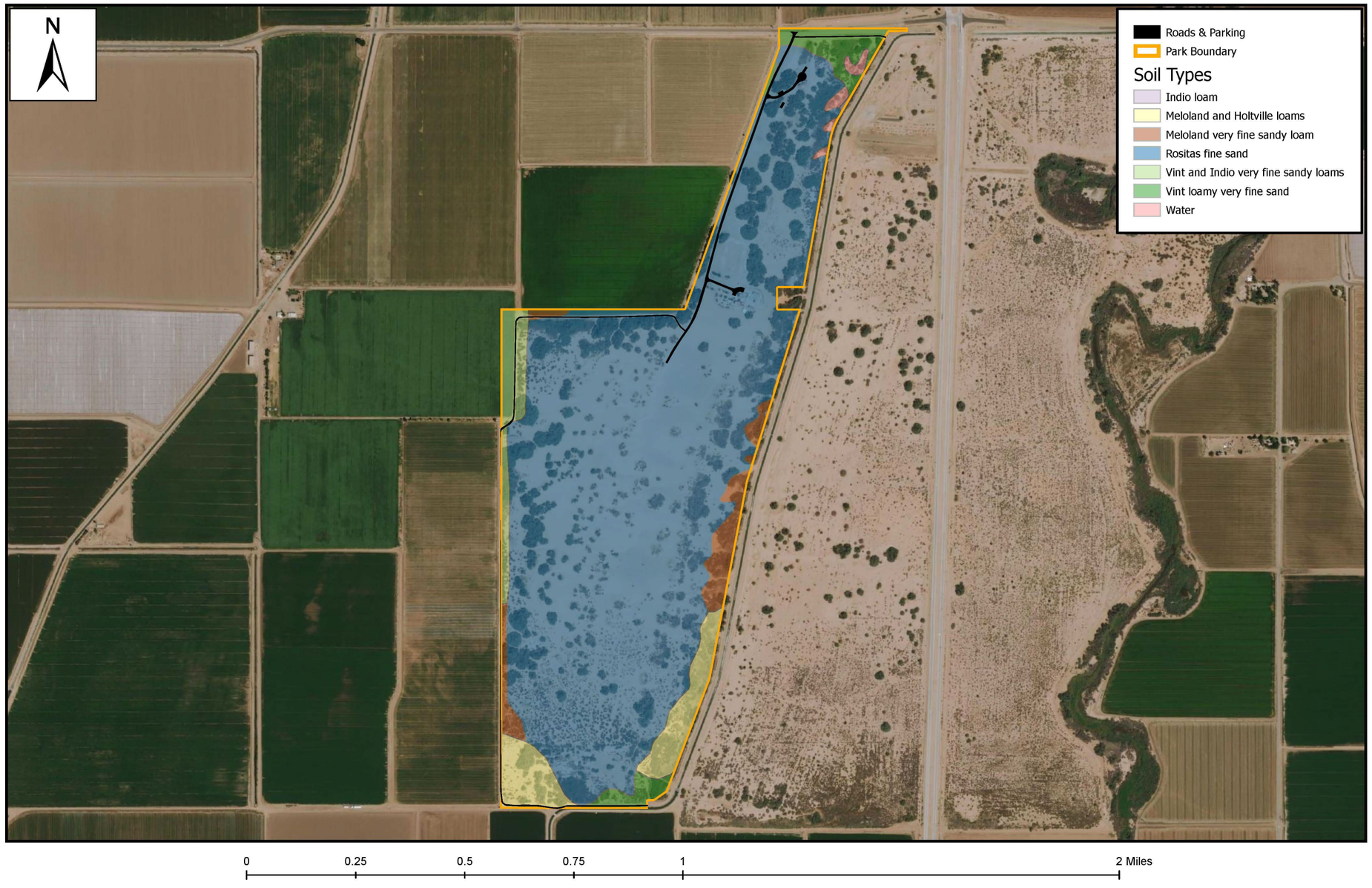

Figure 6. There are six unique soil types at Heber Dunes SVRA.

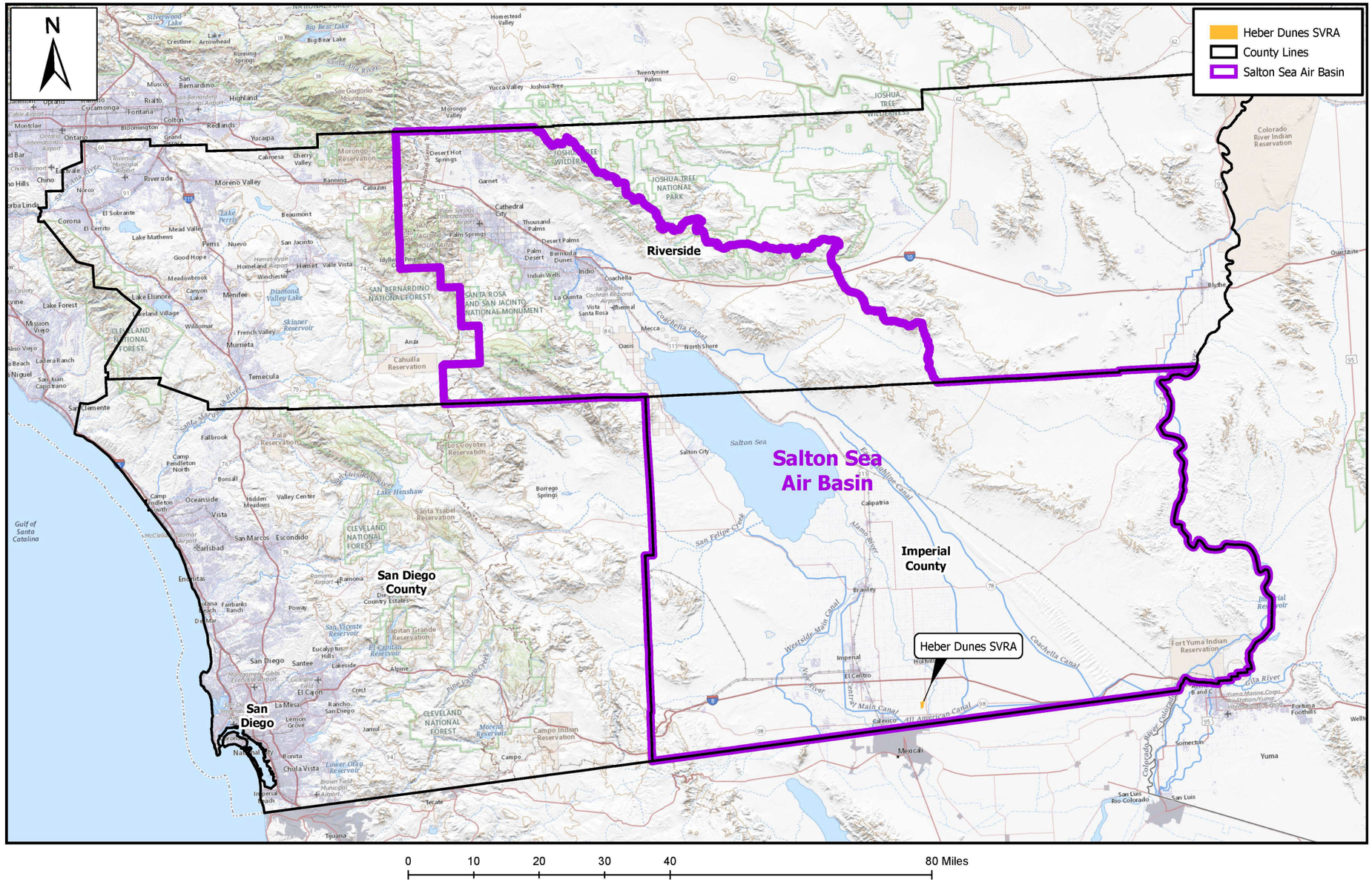

Figure 7. Regional extent of the Salton Sea Air Basin in relation to three Southern California counties and Heber Dunes SVRA.

average seasonal precipitation at one time, or only a trace of precipitation may be recorded at any locale for the entire season (CRBRWQCB, 2006).

The flat terrain of the SSAB, coupled with strong temperature differentials created by intense solar heat, produces moderate winds and deep thermal convections. The county experiences mild and dry winters with daily maximum temperatures that range from 65 to 75 degrees Fahrenheit (°F), while the daily maximum temperatures during the hot summer months are in the 104 to 115°F range (AECOM 2011a). The mean monthly temperature ranges from 55 to 90°F (AECOM 2011a).

Wind speeds are generally less than 10 ten mph; however, between April and May, the county may occasionally experience wind speeds greater than 30 mph between April and May. Predominant wind directions are from the west and west-southwest during all four seasons, and the average annual daily wind speed is 6.9 mph.

A common atmospheric condition between November and June in the county is known as a temperature inversion, where air temperatures become warmer with increasing height. An inversion can be associated with little air movement and stagnant conditions, and. It can persist for one or more days, thereby trapping air pollutants below and preventing their dispersion, thus increasing pollutant concentrations. The height of the inversion determines the size of the mixing volume trapped below. Inversion strength or intensity is measured by the thickness of the layer and the temperature difference in temperature between the base and the top of the inversion. The strength of the inversion determines how easily it can be broken by winds or solar heating. Inversions appear to be relatively rare between July and October.

2.3.3 Air Quality

The Imperial County Air Pollution Control District (ICAPCD) is the agency responsible for protecting public health and welfare in the county by administering federal and state air quality laws and policies. ICAPCD's tasks include monitoring air pollution, preparing the Imperial County portion of the State Implementation Plan (SIP), and promulgating its rules and regulations. The SIP includes strategies and tactics to attain and maintain the acceptable air quality in Imperial County. In 2010, the county's primary sources of air emissions were from fossil fuel combustion, on-road vehicles, industrial processes, agricultural tilling, fertilizer and live-stock, and road dust (AECOM 2011a).

Both the California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (EPA) designate areas according to their attainment status for criteria air pollutants. These designations aim to identify the areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified based on available information as meeting or not meeting the standards.

The Clean Air Act allows a nonattainment area to be redesignated as attainment if the EPA determines that the 24-hour PM_{10} National Ambient Air Quality Standard (NAAQS) has been attained, in addition to other requirements. The 24-hour PM_{10} NAAQS allows for one exceedance of the 24-hour average PM_{10} standard (150 µg/m^3) per year averaged over a three consecutive calendar year period, excluding exceptional events, measured at each monitoring site within an area based on quality-assured air quality monitoring data (ICAPCD Staff Report 2018). If an area is redesignated from nonattainment to attainment, the federal Clean Air Act requires a revision to the SIP. This revision called a maintenance plan demonstrates how the air quality standard will be maintained for ten years. Until 2018, the SSAB had been designated by federal EPA standards as a moderate nonattainment area for the 8-hour ozone standard and a serious nonattainment area for respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less (PM_{10}).

In 2018, the ICAPCD submitted the 2018 Redesignation Request and Maintenance Plan for Particulate Matter Less than 10 Microns in Diameter (2018 PM_{10} Plan) to CARB requesting redesignation of the Imperial Valley as attainment for PM_{10} standards. According to ongoing monitoring of the SSAB, the ICAPCD demonstrated that when excluding exceptional events, the Imperial Valley did not violate the federal 24-hour PM_{10} NAAQS during the relevant time period. CARB approved the redesignation request in December 2018, and subsequently, the request was approved by EPA in October 2020 (EPA 2020). The SSAB is in attainment for the other criteria air pollutants.

In conjunction with ICAPCD, the park finalized a Dust Control Plan for the SVRA in 2017 to comply with Imperial County's Rule 800 – General Requirements for Control of Fine Particulate Matter (PM_{10}). The Dust Control Plan calls for control measures on two paved roads within Heber Dunes SVRA that average greater than 50 vehicle trips per day. Off-road special events or races with more than fifty vehicle trips per day would also require control measures. Primary control consists of road treatments, such as gravel or pavement, to main routes of travel within Heber Dunes SVRA. An update to the Dust Control Plan is anticipated in 2022. The Dust Control Plan will be subsequently updated and submitted to the Imperial County Air Pollution Control District every two years.

2.3.4 Hydrology and Water Resources

Heber Dunes SVRA is located within the Imperial Hydrologic Unit (HU) of the Colorado River Basin. The Imperial HU encompasses an area of approximately 2,271 square miles. The major drainages within the Imperial HU consist of the Alamo and New Rivers. The Alamo and New Rivers lie approximately 0.5 miles east and nine miles west of Heber Dunes SVRA. Both rivers drain to the Salton Sea approximately 30 miles to the north of Heber Dunes SVRA. These rivers convey agricultural irrigation drainage water from farmlands in the Imperial Valley, surface runoff, and lesser amounts of treated municipal and industrial wastewaters. The flow in the

New River also contains agricultural drainage, treated and untreated sewage, and industrial waste discharges from Mexicali, Mexico (CRBRWQCB, 2006).

Colorado River water, imported via the All American Canal, is the predominant water supply for the area and is used for irrigation and industrial and domestic purposes (CRBRWQCB, 2006). Numerous canals and agricultural drainages also occur within the Imperial HU. The Ash Main Canal lies approximately 0.5 miles to the west of Heber Dunes SVRA, while the South Alamo Canal borders Heber Dunes SVRA on the east and west boundaries.

Most of the surface drainage from the Heber Dunes SVRA appears to infiltrate the groundwater. Overall drainage is west and northwest (Wright Environmental Services, 2009). Water may pond before infiltrating in the clay flats south of the office. Groundwater is estimated to occur within 50 feet of the surface (Wright Environmental Services, 2009).

2.3.5 Noise

Existing noise sources at Heber Dunes SVRA primarily consist of transportation from vehicular traffic on regional and local roads and OHV activity, both on and off-site. To a lesser extent, occasional aircraft overflights and seasonal operation of agricultural equipment on adjacent property contribute to the noise environment at the park. There are no noise-sensitive receptors in the area.

As part of a Division-wide effort, a passive noise monitoring station was installed on October 5, 2021, in the park's maintenance yard, which is towards the center of the unit. Additionally, noise will be actively monitored at the unit two days per year.

2.3.6 Cultural Resources

Heber Dunes SVRA has been fully inventoried for historic and prehistoric resources of potential significance since 2009. No resources have been identified to date that would constrain SVRA management and use. District archaeologists review individual projects to ensure resource avoidance and protection.

Before the 2011 General Plan, a records search was conducted at the South Coastal Information Center, and contracted archaeologists conducted a pedestrian survey. State Parks policy recommends cultural surveys every five years to capture changes in resource presence and conditions over time. District archaeologists most recently surveyed the park in 2019.

2.4 Natural Resource Assessment

2.4.1 Wildlife Inventory

A variety of sources were used to compile a Wildlife Inventory Table for Heber Dunes SVRA (Appendix 1). The full inventory of these sources includes four amphibians, one arthropod, 90 birds, two fish, one fungus, four insects, 36 mammals, 122 plants, and 16 reptiles. Of these, 140 species have been documented within Heber Dunes SVRA.

This inventory began with internal records sourced from field surveys, the General Plan, and staff notes. Staff then pulled records from established databases, including the California Natural Diversity Database (CNDDB) run by the California Department of Fish and Wildlife, California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants of California, and the United States Fish and Wildlife Service's Information for Planning and Consultation (IPaC) system. Records were searched based on a nine United States Geological Survey 7.5' Quadrangle search methodology. However, only six quadrangles returned data due to Heber Dunes SVRA's proximity to Mexico. These quadrangles are Bonds Corner, Calexico, El Centro, Heber, Holtville East, and Holtville West. In addition to these searches, Calscape, eBird, and iNaturalist were used to refine observation and range data.

Once all data was collected, staff used habitat requirements and range estimates to determine a given species' potential presence and information about past observations at the SVRA. Past observations included those from formal field assessments and incidental observations. A brief justification was written to add the context of these conclusions.

The inventory contains two federally endangered species, one federally threatened species, one state endangered species, two state threatened species, 25 California Species of Special Concern (SSC), seven species listed on the California Watch List, and nine CNPS ranked rare plants. Of these, 12 SSC, four California Watch List, and two CNPS ranked rare plants are known to occur on-site.

2.4.1.1 Field Assessments

Following the desktop assessment, staff assessed the current field assessment methodology and datasets to inform the park's species inventory. Historically, staff has conducted avian, reptile, small mammal, and vegetation surveys throughout the unit, with a shift in recent years to emphasize avian and small mammal surveys. Field assessments conducted within the past ten years were considered current, while records from over ten years ago were considered historic. Current protocols can be found in Appendix 3.

The species table (Appendix 1) identified one amphibian, six avian, five mammal, four reptile, and 31 plant species last observed in the historical datasets. Gaps in observations may be

explained by several factors, including bias or experimental error from field assessment protocols, inaccurate or poor-quality historical records, changes in environmental condition, and lack of regular and reliable resource staff presence, among other factors. In addition, information for Heber Dunes SVRA may have been historically sourced from Ocotillo Wells SVRA datasets in early planning documents due to limited site-specific data. Although monitoring of vegetation, reptiles, mammals, and birds occurred consistently in the past, previous monitoring efforts were not well described.

Amphibians

Formal amphibian surveys have never been conducted at Heber Dunes SVRA. The park contains no aquatic features, although there are canals adjacent to the park's boundary in all directions. Park records list a Woodhouse's toad (*Anaxyrus woodhousii*) from 2002. Many of the agricultural fields around the SVRA have been rotationally cultivated and fallowed. These periodic changes in use and site conditions may have contributed to a lower quality habitat for amphibian species. No field assessments for amphibians are considered necessary due to the lack of suitable habitat within the SVRA and adjacent to the property.

Avian

Avian surveys were conducted at Heber Dunes SVRA beginning in 1999. Three plots were surveyed in the spring and autumn between 1999 and 2011, utilizing a point-transect protocol developed by San Diego State University (SDSU)(McClenaghan et al., 1998). These plots were located within saltbush, arrow weed, and dune habitats. In 2012, no surveys were conducted due to staffing constraints; however, a new variable circle point-count protocol was developed to meet recommendations from the University of California, Davis (UC Davis) that year and used in 2013. Between 2014-2016, annual monitoring was not conducted as new protocols were tested at Ocotillo Wells SVRA.

In 2017, avian surveys resumed at three plots in winter. As of 2018, three plots are surveyed in the spring and autumn using the original SDSU protocol (McClenaghan et al., 1998). Plots were located within saltbush, arrow weed, and dune habitats. In 2017 and 2018, surveys occurred twice daily – once near dawn and again near dusk. As of 2019, surveys are only completed in the morning as it was an operational challenge to conduct surveys at the extremes of each day. Due to COVID-19 limitations, in 2021, surveys were conducted using autonomous recording units that captured calls for a week and were then analyzed by Division consultants. The use of autonomous recording units continued in 2022. See Appendix 3 for protocols.

Six species were captured in historic datasets but not observed during the past ten years of field assessments. While the overall park dataset is robust and current protocols seem to be sufficient; there are a few areas of concern. Since bird surveys have primarily been conducted by district staff, staff turnover likely increased the variability of staff experience of local birds

and their calls over the years. Additionally, bird surveys are a limited district focus, and staff receives little formal training. It is hoped that the addition of autonomous recording units to existing in-person surveys can supplement ongoing efforts and reduce uncertainty in auditory data. Following initial results of autonomous recording units, staff should compare protocol efficacy to staffed avian surveys.

Mammals

Small mammal surveys began in 1999 at the park. Surveys were based on a protocol developed by SDSU (McClenaghan et al., 1997) for Ocotillo Wells SVRA but modified slightly for Heber Dunes SVRA. Surveys were for three nights, and three plots covered the saltbush, creosote bush, and arrow weed/baccharis habitats. In addition, a trail camera was installed at one location at Heber Dunes SVRA for some time in late spring or summer. Additionally, tracks were recorded as part of an informal survey effort. The small mammal trapping protocol was updated in 2012 by UC Davis, and annual surveys were not conducted between 2014-2016.

In 2017, four small mammal transect lines were established at Heber Dunes SVRA for live trapping using Sherman traps in different habitats following the original SDSU protocol (McClenaghan et al., 1997). Plots are surveyed twice per year, once in spring and again in fall. Plots are not utilized if ants are prevalent along the transect line to avoid harm to captured small mammals, per the conditions of the park's California Department of Fish and Wildlife (CDFW) Scientific Collecting Permit. Due to COVID-19, only two plots were surveyed in 2021. See full protocol in Appendix 3.

Since 2019, acoustic bat recorders have been set in three locations at the unit. Units are typically set twice per year for a month in spring and fall. While district set and maintain the recorders, Division contractors analyze the data set. See full protocols in Appendix 3.

While small mammals are well covered through current sampling, larger mammals (such as coyotes and bobcats) are less represented. In part, this can be attributed to less staff coverage at the park as historically, more employees worked at the unit and resources conducted additional surveys. Resource staff should consider testing sampling methods and protocols for large mammals in the future, including using wildlife tracks or trail cameras to supplement incidental observations and refine the species inventory.

Reptiles

In the fall of 1999 and spring of 2000, reptile surveys were conducted twice per day in spring and fall using a protocol developed by SDSU (McClenaghan et al., 1998). The protocol combined transects with a time constraint. Captures were limited over the years, so in 2002, the protocol changed to incorporate pitfall buckets.

No surveys occurred between 2014 to 2016. In 2017, time-constrained transects were introduced based on the original protocol. Pitfall buckets were implemented in 2018 but canceled in 2019 due to limited capture and concern over trap placement. In discussions with the San Diego Natural History Museum, the staff focused surveys on avian and small mammals. As of 2020, all pitfall buckets have been removed from the park. Incidental observations are noted in the species table.

Limited staffing at Heber Dunes SVRA and unsuccessful sampling efforts makes it challenging to maintain a full inventory of reptiles at the park unit, as incidental observations tend to be a less reliable dataset. Resource staff should consider implementing a citizen science program such as iNaturalist to bolster incidental data points. Additionally, staff may consider using tracks for species that would be uniquely identifiable.

Vegetation

Surveys alternated year-to-year to focus on annual or perennial species. Vegetation surveys were not conducted in 2010, 2012, or between 2014-2017. In 2018, district staff conducted transect surveys (McClenaghan et al., 1998) of perennial vegetation. This effort was discontinued in 2019 due to dense stands of tamarisk and arrow weed that were challenging to survey. In 2022, a community-level inventory was completed; see section 2.4.2 for further information.

The greatest variation in the species inventory was of vegetation observations. Old documents listed species in a species inventory, but other information stated that the park was outside the species range, and there were no other regional detections. These early species lists were likely sourced from Ocotillo Wells SVRA rather than through field surveys. In general, this variation is driven by annual vegetation. A citizen science program such as iNaturalist should be implemented at the unit to assist in the inventory of annual plants.

2.4.2 Native Plant Community Inventory

In 1998, SDSU classified the SVRA into six communities (McClenaghan et al., 1998) using aerial imagery and ground-truthing. An update to this vegetation community map was finalized in Spring 2022, using the state's current standard for vegetation classification and mapping: California Fish and Wildlife's Vegetation Classification and Mapping Program (VegCAMP). VegCAMP classifies vegetation according to the National Vegetation Classification System standards, which is a hierarchal classification of vegetation types, distinguishing alliance and association at the finest scale. An association is a characteristic range of species composition, while an alliance is composed of one or more associations. Field surveys identify vegetation alliances and/or associations, and mappers delineate landcover into alliance or association polygons based on information from field surveys and interpretation of aerial imagery. The resulting maps and data provide a foundation for tracking vegetation change, land use, and

protection and restoration actions undertaken at the SVRA. More information about this protocol can be found in Appendix 3.

Six vegetation community alliances were identified at Heber Dunes SVRA during surveys in April 2022, along with two non-vegetative landcover types (Figure 8). A description of each alliance can be found below. For further information on each alliance, please visit https://vegetation.cnps.org/. The 2022 survey and mapping effort found the same vegetation communities as in the 1998 classification; however, the current map delineates the community types at a finer scale, using the VegCAMP standard of a 1-acre minimum mapping unit.

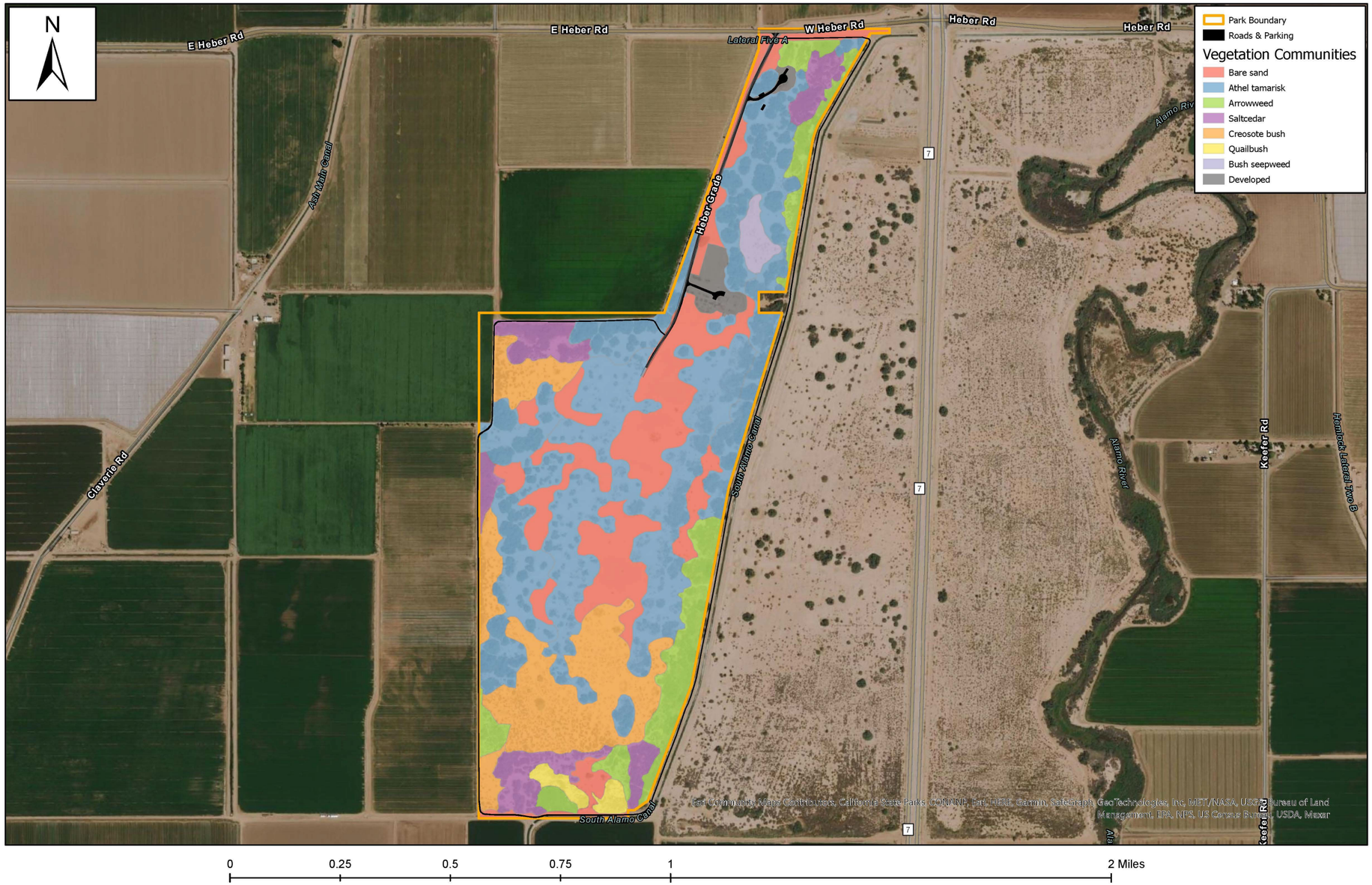

Figure 8. Six distinct vegetation alliances were mapped in VegCAMP in 2021-2022, along with open and developed landscapes.

2.4.2.1 Arrow Weed Thickets Shrubland Alliance

This alliance is strongly dominated by arrow weed (*Pluchea sericea*), with low cover of other shrubs including quailbush (*Atriplex lentiformis*) and willow baccharis (*Baccharis salicina*). Stands tend to occur in irrigation ditches, canyon bottoms, and seasonally flooded washes, generally in alluvial or aeolian derived sands or clay loam soils. This alliance covers 31 acres of Heber Dunes SVRA, primarily along the park edges near the perimeter roads. Arrow weed stands form dense thickets in the park, especially along the eastern and western sides of the park. Some parts of the stands on the east side of the park have significant dead material, likely related to drought stress. Arrow weed is known to stabilize eroded areas, although it may replace other species once established (UCB, 2006).

2.4.2.2 Creosote Bush Scrub Shrubland Alliance

This alliance is dominated by creosote bush (*Larrea tridentata*), covers 52 acres of Heber Dunes SVRA, mostly along the western and southern boundaries of the unit. Stands are open to intermittent, with evenly spaced shrubs and a sparse to absent herbaceous layer.

2.4.2.3 Quailbush Scrub Shrubland Alliance

This alliance is dominated by quailbush (*Atriplex lentiformis*), mixed with a lower cover of arrow weed (*Pluchea sericea).* Stands cover 5 acres of Heber Dunes SVRA, at the southern end of the park. Canopy cover is dense to intermittent. Elsewhere, this alliance has been used in restoration projects to provide cover to wildlife and for erosion control in riparian zones (Favorite, 2006).

2.4.2.4 Bush Seepweed Shrubland Alliance

This alliance is dominated by bush seepweed (*Suaeda moquinii* alt. *S. nigra).* There is one stand of this alliance at the SVRA, covering 4 acres, with sparse cover. Shrubs were mature to decadent, with significant amounts of dead material, likely related to drought stress.

2.4.2.5 Tamarisk (Athel Tamarisk and Saltcedar) Thickets Shrubland Semi-Natural Alliance

At Heber Dunes SVRA, two species of non-native tamarisk are present: athel tamarisk (*Tamarix aphylla*) and saltcedar (*Tamarix ramosissima*). VegCAMP classifies all tamarisk species under one alliance and association. However, because of the distinct difference in height class and ecology of the two species at Heber dunes, stands of each species were mapped separately. Total cover for both species is 168 acres.

Athel tamarisk (*Tamarix aphylla*) stands are widely distributed in the SVRA, covering 143 acres. Athel tamarisk trees are tall (5-10 meters) and occur in dense clusters with close to 100% cover. Due to the size of athel tamarisk present at the SVRA, it is presumed to be historical, although there is no known historical context. This non-native species is of minor management concern as it does not spread rapidly at the SVRA.

Saltcedar (*Tamarix ramosissima*) stands cover 25 acres of the SVRA. This species is more shrub-like than athel tamarisk, at 2-5 meters in height. Stands are dense to intermittent. This species is of greater management concern as it tends to be invasive throughout the southwest. However, historic imagery available on Google Earth shows that stands at the SVRA have not significantly expanded in the past 20 years. Further discussion on invasive management is included in Section 2.4.4.1.2 of this document.

2.4.2.6 Other Landcover Areas

In addition to the vegetation alliances discussed previously, there are two non-vegetated landcover areas: bare sand and developed space. Landcover is the physical material at the surface of the earth, which includes vegetation, bare ground, development, and water.

Bare sand landcover covers 64 acres of the SVRA, primarily towards the center of both the northern and southern parts of the park. Bare sand areas consist of open dunes. Annual plants grow seasonally in the dunes, but there is limited perennial vegetation.

Developed areas consist of park facilities, including paved roads, and covers 10 acres of the SVRA. There are two primary developed areas identified in the SVRA, with a smaller area towards the northern part of the unit and a larger developed area in the park's center. Vegetation that occurs in these areas may be more maintained or landscaped than in other areas of the unit.

2.4.3 Sensitive Resource Areas

Sensitive resource areas are established areas with outstanding natural or scientific significance. Per PRC §5019.71, resources of interest include features such as “rare or endangered plant and animal species and their supporting ecosystems, representative examples of plant or animal communities existing in California prior to the impact of civilization, geological features illustrative of geological processes, significant fossil occurrences or geological features of cultural or economic interest, or topographic features illustrative of representative or unique biogeographical patterns.”

Currently, no officially designated sensitive resource areas are present within the SVRA. While certain resources, such as the native vegetation communities, are of greater management concern, they do not warrant escalation to a defined sensitive resource area. Similarly, several

California SSC utilize the SVRA, but none have limiting habitat restrictions and may utilize the entirety of the SVRA. If conditions change in the future, sensitive resource areas may be established.

2.4.3.1 Rare or Endangered Plant and Animal Species and Their Supporting Habitats

There are no federal or state-listed species known to occur within Heber Dunes SVRA; however, several California SSC or California Watch List species are present within the SVRA. These species are described below and may be referenced as sensitive or special-status species elsewhere in the document. In instances that Imperial County data was unavailable, San Diego datasets were reviewed, particularly those that described desert conditions.

Cooper's Hawk

Cooper's hawk (*Accipiter cooperi*) is a common woodland hawk that is listed as a California Department of Fish and Wildlife (CDFW) Watch List species. This species is adapted to disturbed areas with trees and prefers to nest in tall trees with extensive canopy cover. Preferred habitat includes oak groves and mature riparian woodland, although urban eucalyptus is also well-used. Cooper's hawks are slender, medium-bodied hawks with rounded wings and long tails. Their primary food source is medium-sized birds; however, they will also prey on mammals and rob nests.

While not ideal habitat, Heber Dunes SVRA does contain suitable habitat for this species, and the park is within the wintering range of this species. The park is approximately 30 miles outside the year-round range, and while potential habitat features that may be marginal for nesting are present within the SVRA, the unit may be too far outside the year-round range to warrant a nesting attempt. Utility towers and tamarisk are present within the SVRA that could potentially be utilized for nesting; however, they are not ideal due to limited canopy cover. This species has been observed during both spring and fall surveys. Within the SVRA, this species was last observed on October 9, 2018, during an avian survey along the canal.

Burrowing Owl

Western burrowing owl (*Athene cunicularia*) is a subterranean ground-dwelling species that occupy open grasslands and desert with low-lying vegetation. This species has adapted to disturbed and human-modified agricultural lands. Burrowing owl tend to occupy the burrows of ground squirrels, prairie dogs, and desert tortoises; however, burrowing owl will dig their own burrows when excavated burrows are not available. During the day, the burrowing owl will hunt prey on the ground outside their burrows. CDFW currently lists this species as an SSC.

Breeding pairs stay near an established nesting burrow, while wintering owl are more mobile and may roost in vegetation rather than burrows. In California, the breeding season is

recognized generally as March to August, but breeding can begin as early as February and extend into December (Shuford and Gardali, 2008). In the Imperial Valley, burrowing owl are more numerous in summer than winter (Unitt, 2004).

Burrowing owl have been observed foraging and nesting on infrequent occasion within Heber Dunes SVRA, most recently in 2017, but agricultural lands outside of the park tend to be utilized for roosting more than the SVRA. California provides year-round habitat for this species, with the Imperial Valley supporting increasing populations of this species on land converted to agricultural use (Shuford and Gardali, 2008). This species was last observed by district staff within downed tamarisk in the southern portion of the SVRA in 2017; however, regular observations of this species occur off-site in nearby, non-adjacent agricultural fields.

Northern Harrier

Northern harrier (*Circus hudsonius*) is a slim, long-tailed hawk with a broad distribution across North America. They are regularly observed gliding over marshes and grasslands. During winter, northern harriers utilize a wide variety of habitats with low vegetation, including deserts, croplands, old fields, and grasslands. Primary prey includes small mammals and songbirds. Rainfall can vary the size of populations of northern harrier as it controls the abundance of prey available (Unitt, 2004). This species is a California SSC.

The northern harrier commonly winters in suitable open habitats throughout the southwest, including the Imperial Valley (Patten et al., 2004). The Imperial Valley, along with other southern California desert valleys, supports hundreds of northern harriers each winter, and suitable foraging and roosting is available within agricultural fields (Patten et al., 2004). When nesting in the winter, northern harriers roost on the grounds in groups, sometimes with short-eared owls. Preferred sites are in dense, tall shrubby vegetation patches in undisturbed areas (Shuford and Gardali, 2008).

Heber Dunes SVRA is within the wintering and nonbreeding range of northern harrier. The park contains suitable foraging habitats, along with adjacent agricultural lands. Due to site disturbance, the park likely does not support quality roosting habitat, but adjacent agricultural lands may be better suited. The last observation of the northern harrier by park staff was a flyover on September 29, 2020, during avian surveys in the saltbush plot. Northern harriers have only been observed during fall avian surveys.

Merlin

Merlin (*Falco columbarius*) are small, fierce falcons that primarily occupy forests; however, open and semi-open habitats may be utilized. During migration, grasslands, open forests, and coastal areas are utilized. Merlins primarily hunt smaller birds, catching them mid-air during high-speed attacks, and may partner to target flocks of birds. Merlins tend to be solitary, but

they may travel in groups and roost communally during migration. Similarly, during winter, pairs may winter together. This species is on the CDFW Watch List.

The SVRA is in the nonbreeding range of merlin, and the park contains suitable habitat for foraging. Portions of Heber Dunes SVRA are composed of open and semi-open habitat, and small birds are known to utilize the park (Appendix 1). The last observation of this species was a flyover recorded on April 18, 2018, during a canal plot avian survey.

Loggerhead Shrike

Loggerhead shrike (*Lanius ludovicianus*) is present throughout much of Northern America in grasslands and open habitats. From perches, shrikes will ambush their invertebrate and vertebrate prey, then skewer their catch on barbed wire or vegetative thorns as a cache. During the breeding season, insects tend to be the primary diet of loggerhead shrikes, while vertebrate species are utilized to a greater extent during winter. Nests are regularly built within thorny vegetation, between two and four feet above the ground. In the absence of shrubs or trees, nests may be built within brush piles or tumbleweeds. Loggerhead shrike is a California SSC.

Heber Dunes SVRA provides year-round habitat for loggerhead shrike. This species is resident within the SVRA and is regularly observed by park staff. Vegetation, park signs, posts, utility poles, and towers provide ample perch sites for this species throughout the park. Additionally, native vegetation within the SVRA provides appropriate nesting habitat. Avian surveys within the SVRA consistently observe this species during spring and fall. The last observation in the SVRA was on October 1, 2020 at the Canal plot.

Black-tailed Gnatcatcher

Black-tailed gnatcatcher (*Polioptila melanura*) is a tiny songbird that occupies semiarid and desert scrub in the southwestern United States and northern Mexico. They primarily prey on insects through foliage gleaning, although this may be supplemented by fruit or seeds. Nests are built in forks of branches of dense thorns or leaves, with overhead and side vegetative cover to provide shade. Both shrubs and trees are utilized. Breeding pairs are monogamous, and pairs defend year-round permanent territories. This species is on CDFW's Watch List.

Heber Dunes SVRA is within the year-round range of black-tailed gnatcatcher, and annual avian surveys confirm the species utilizes the park. The species is regularly observed during spring and fall avian surveys. The most recent observation of this species was on September 30, 2020 at the Canal Plot.

Yellow Warbler

Yellow warbler (*Setophaga petechia*) is a brightly colored, small songbird. It primarily spends the breeding season in vegetative thickets in disturbed habitats near streams and wetlands.

Nests are placed within the vertical fork of a shrub or small tree, typically within 10 feet of the ground but ranging up to 40 feet. Yellow warblers form monogamous breeding pairs, which sometimes last more than one breeding season. This species is a California SSC.

Heber Dunes SVRA is within the breeding range of this species and is not far outside of the migratory range. Nests have not been observed on-site, but suitable habitat is present within the park, particularly adjacent to the canal. Riparian habitat is present along the Alamo River, which is east of the SVRA and SR-7. Staff most recently observed this species on September 30, 2019, during avian surveys in the creosote plot.

Yellow-headed Blackbird

Yellow-headed blackbirds (*Xanthocephalus xanthocephalus*) utilize wetland habitat during the breeding season, then move southwest into crop and ranch lands in winter. Additionally, foraging may occur in croplands, grasslands, and savannahs. This species forms foraging flocks that will return to the same areas multiple days. Nesting sites overhang the water in cattails, reeds, willows, and tamarisk. This species is a California SSC.

Heber Dunes SVRA is within the year-round habitat for this species. There is no suitable nesting habitat within the park due to the lack of vegetation that would overhang the canal around the park's perimeter road. Foraging habitat is primarily available adjacent to the unit on agricultural lands, not in Heber Dunes. This species has been observed as a flyover before, on September 29, 2020, along the canal.

Western Mastiff Bat

Western mastiff bat (*Eumops perotis*) is the largest bat species found within California. It ranges from central Mexico across the southwestern United States, including portions of California, Nevada, Arizona, New Mexico, and Texas. Western mastiff bat is dark gray with long narrow wings and large ears that meet above the forehead. The species is considered a California SSC.

E. perotis is a strong, fast flier, allowing for extensive foraging ranges. Foraging occurs in open habitats such as dry desert washes, flood plains, and agricultural fields in California. Foraging calls are audible. While the species is found in a variety of habitats, roosting is limited to significant rock features that contain suitable crevices. Cracks in buildings may be used for roosting. On rare occasions, the species has been observed roosting in palm trees, although this is expected to be for temporary use only (Tremor 2017). Typical roost sites are high enough from the ground to allow for at least 10 feet vertical drop from the entrance for flight.

The species tends to move small distances seasonally rather than a prolonged migration and do not hibernate in winter (Pierson and Rainey, 1998). Mating appears to occur in spring, with

birth occurring in early-to-mid summer. This species is colonial, although colonies are small, containing both males and females throughout the year.

Heber Dunes SVRA is present in the year-round range for this species. Both the park and adjacent property provide foraging habitat, and the canal is likely utilized as a drinking site. As this species has specific site requirements for roosting, the SVRA provides at best, marginal day roosting habitat. Further investigation would be needed to determine if day roosting habitat is present, and if it is occurring (The Wildlife Project, 2022). Auditory detection on-site has observed this species, most recently in the summer of 2021 (The Wildlife Project, 2022).

Western Red Bat

The western red bat (*Lasiurus blossevillii*) is closely associated with cottonwood trees in riparian zones, although wooded suburban neighborhoods and orchards may be utilized. They only roost in tree foliage, particularly in trees that form dense canopies above their roosts and where branches do not obstruct the flyway below the roost. Western red bats are bright red, well-furred small-to-medium-sized bats with darker contrasting colors on their wings. When roosting, their coloration mimics dead tree leaves. This species is primarily found in wooded environments at low elevations.

Western red bats begin foraging within a couple of hours of dark; then, after a period of rest, they may continue into the following morning. Individuals appear to favor certain foraging locations that are utilized regularly, typically within one kilometer of their roosting location (Tremor, 2017). Moths are their primary prey, but flies, beetles, and crickets may also be eaten.

The species is typically solitary but will form groups during migration and mating. They may also roost and forage in proximity to other western red bats. Males and females of the species migrate at different times and have differing summer ranges, suggesting seasonal sexual segregation (Tremor, 2017). Typically, they migrate south in the winter and are active in areas with mild temperatures as low as 55-65°F (*Western Red Bats*, 2019). Mating occurs between August to October, with fertilization occurring in the following spring. Females give birth in late spring to early summer.

Threats to the species include birds of prey, roadrunners, and domestic cats. The loss of riparian habitat is considered the greatest threat to western red bats in the southwestern United States, particularly the loss of cottonwood habitats. Human activities such as barbed wire fencing, motor vehicles, pesticide usage, and general negative public impression of bats are considered threats. The species is currently considered a California SSC.

The SVRA is within the range of western red bats, although winter lows in the area may not be within the suitable temperature range for this species. The species is rare, and probably absent from extreme deserts in southern California, but the presence of nearby habitat increases the

likelihood of its presence near Heber Dunes SVRA (Stokes, personal communication). The South Alamo Canal may be utilized as a drinking site for this species, and Heber Dunes SVRA may be used for foraging. Cottonwood habitat is not present on-site, and tamarisk trees may not provide sufficient cover for roosting, but nearby habitats such as the New River may be utilized. This species was observed at the SVRA during acoustic monitoring in the summer of 2020 (The Wildlife Project, 2022). Due to species' relative rarity in the region, additional verification of this species through other surveys or manual verification of calls is needed (Stokes, personal communication).

Western Yellow Bat

Western yellow bat (*Lasiurus xanthinus*) is a medium-sized bat with dull yellow fur and black contrasting wings. This species roosts exclusively in foliage, typically individually but sometimes in small groups, particularly in dead fronds around the base of palm trees. While this species used to be found almost exclusively in California fan palm groves and desert riparian habitats, it has recently expanded its range towards the coast utilizing both landscaped palms and natural riparian corridors (Tremor, 2017). The diet of western yellow bats consists primarily of beetles, flies, moths, grasshoppers, and crickets.

A portion of the population may be migratory, but individuals are present throughout the range year-round. Similarly, the species is not believed to hibernate as active individuals are observed throughout the range year-round. Capture sites are typically associated with water features, both natural and man-made. Seasonal sexual segregation may occur between late spring to early summer, during parturition (Pierson and Rainey, 1998).

The species is currently considered a California SSC due to limited information on its distribution and selective habitat requirements. Threats include the removal of dead fronds from ornamental palms, using pesticides in orchards, and potential predation from domestic cats.

Heber Dunes SVRA is within the year-round range for the western yellow bat. The species have been auditorily recorded during winter and summer, most recently in summer 2021 (The Wildlife Project, 2022). Suitable foraging habitat is present on-site, with limited roosting habitat present on and adjacent to the park unit (The Wildlife Project, 2022).

California Leaf-nosed Bat

The California leaf-nosed bat (*Macrotus californicus*) is a medium-to-large bat with grayish coloration, big ears, and a distinct leaf-like nose. The species has limited distribution in the southwestern United States (portions of Arizona, California, and Nevada), extending south into Central America. In San Diego and Imperial Counties, California leaf-nosed bat is primarily observed in the desert; however, within the past couple of decades, observations of this

species have been made in valleys and foothills (Tremor, 2017). The species is well-associated with the lower Colorado River and mountainous mines in Riverside County (Braun and Unnasch, 2020). The species is currently a California SSC.

Roosting occurs in natural caves or cave-like features, such as downed trees, mines, and buildings. Overwintering, maternity, and mating roost locations may be limited to mines or caves (Braun and Unnasch, 2020). The species appears to be active year-round throughout its range and is considered intolerant of roost temperatures below 23°C (Tremor, 2017). Summer and winter roost locations are often close in proximity and tend to be in areas that average 29°C near the roost entrance. Females form maternity colonies in spring and summer; large male colonies may also form. Females give birth in late spring to early summer, and maternity colonies disband once the young are independent in late summer.

Foraging habitat includes desert washes and floodplains composed of plants like the smoke tree, catclaw, mesquite, palo verde, and desert willow (Tremor, 2017). The species is primarily insectivorous and tends to forage close to the ground for large moths, butterflies, and grasshoppers. It is suspected that prey is gleaned from vegetation and the ground, as many prey species are flightless or diurnal fliers.

Heber Dunes SVRA is within the year-round range for this species; however, the park is likely only utilized for foraging due to this species' specialized conditions for roosting (i.e., caves and mines). This species is known to use buildings on occasion, although it is unknown if this occurs at Heber Dunes SVRA (The Wildlife Project, 2022). Future investigation would be needed to assess buildings' suitability and usage. An acoustic call of this species may have been detected in fall 2020; however, additional work is needed to verify (The Wildlife Project, 2022). Mist netting may be utilized in the future.

Arizona Myotis

Arizona myotis (*Myotis occultus*) is a medium-sized bat present from southeastern California through Arizona, New Mexico, and south into Chihuahua, Mexico. Historically there was debate over the taxonomic status of this species – some researchers considered the species a subspecies of *Myotis lucifugus* based on an allozyme analysis (Valdez et al., 1999) while others considered it a separate species based on cranial measurements (Hoffmeister, 1986). Further work using genomic DNA has classified the Arizona myotis as a separate species (Piaggio et al., 2002). California currently considers *M. occultus* an SSC.

The species is known to occur at higher elevations, although nursery colonies exist along lower elevation desert regions along the Colorado River. Diverse roosting habitat is utilized, including buildings, bridges, mines, and caves. Maternity roosts have been found in bridges, buildings, and tree snags, with hundreds of bats comprising a colony. Limited data suggest that females give birth to a single young in early summer. While not much is known about wintering

behavior and habitat of Arizona myotis, it is theorized that the species may hibernate across their range based on the behavior of their former conspecific *M. lucifugus* (Diamond et al., 2015).

Foraging occurs in association with orchards, permanent water, and riparian vegetation at lower elevations and ponds in forest clearings at higher elevations. Diet consists of mayflies, midges, and mosquitoes.

White-nosed syndrome (WNS) may impact Arizona myotis in the future as related species have been heavily impacted in the eastern United States (Blehert et al., 2009). WNS has spread amongst hibernacula in eastern populations of related species. Management focuses have included monitoring these hibernacula; however, little data is available on the hibernacula of Arizona myotis. The improvement of baseline knowledge will help manage this threat in the future (Diamond et al., 2015).

As much is not known about this species' habitat needs, it is difficult to assess the potential utilization of Heber Dunes SVRA. The site contains habitat that is known to be used by this species (The Wildlife Project, 2022). This species has been auditorily observed multiple years in a row; however, additional data is needed to determine if this species is regularly present (The Wildlife Project, 2022).

Pocketed Free-tailed Bat

Pocketed free-tailed bat (*Nyctinomops femorosaccus*) is a medium-sized bat with dark grayish brown fur, long narrow wings, extended tail, and relatively large ears that meet mid-forehead. The species is a generalist when it comes to foraging habitat and appears to be wide-ranging without a clear habitat preference. The species is insectivorous, primarily eating moths and beetles. It may commute long distances to forage from roosting locations, and the species is currently a California SSC.

Pocketed free-tailed bat primarily roosts in crevices and openings in steep, rocky cliff faces and rocky outcrops. Man-made features such as quarries are also utilized, as well as buildings in portions of its range. In San Diego County, there is no clear evidence that buildings are used for roosting. However, individuals have been found clinging onto the sides of buildings, and one individual has been observed using an artificial bat house in San Diego County (Tremor, 2017). Colonies of up to 50 individuals are formed. Roosts may be in close proximity to the western mastiff bat but rarely near the Mexican free-tailed bat (Tremor, 2017). The distribution of pocketed free-tailed bats is closely linked to their preferred roosting habitat.

The species is a year-round resident in San Diego County, although local seasonal migrations may be made to avoid extreme summer temperatures in the desert (Tremor et al., 2017). Additionally, it is active year-round. Limited information is known about the species'

reproduction. The species bears a single young (Kumirari and Jones, 1990), with birth occurring in summer (Hoffmeister, 1986).

Heber Dunes SVRA contains suitable open foraging habitat for the species year-round, and the canal is likely used as a drinking site. This species has specific micro-habitat requirements for roosting that are generally not present at Heber Dunes SVRA. However, there is some chance that existing facilities and buildings could be used for day roosting; further investigation would be needed to determine the suitability and usage of buildings (The Wildlife Project, 2022). Auditory observations of the species have been made during winter and summer monitoring at the SVRA, most recently in summer 2021 (The Wildlife Project, 2022).

Big Free-tailed Bat

The big free-tailed bat (*Nyctinomops macrotis*) is a large bat with dark grayish brown fur, long narrow wings, an extended tail, and relatively large ears joined in the middle of the forehead. The species ranges from South America to the central United States. There are more records of the species in Arizona, New Mexico, Texas, and Utah, than in California (Pierson and Rainey, 1998). In the southwestern U.S., the species is associated with arid, high-relief landscapes. The species is believed to be a strong flier due to outlying observations (Tremor, 2017). The species is currently a California SSC.

N. macrotis is closely associated with its preferred roosting habitat – vertical cliffs, quarries, rocky outcrops, and occasional tall buildings. The species is also associated with coastal and desert scrub, evergreen forests, riparian zones, and montane woodlands (Hoffmeister, 1986). There is limited information about preferred foraging habitat, and the species is known to fly over wide-ranging habitats while foraging far from its roosts. The species is insectivorous, dieting primarily on moths, grasshoppers, crickets, and stinkbugs.

Limited information is known about reproductive habits, although females are known to bear a single young in summer (Easterla, 1973) and possibly form nursery colonies. No colonies of this species have been found in San Diego County, and only one juvenile has been observed within the County, suggesting that the species is a migrant to or through the area (Tremor, 2017). It is not known whether the species breeds in California (Pierson and Rainey, 1998).

Heber Dunes SVRA has suitable open foraging habitat for this species, and the South Alamo Canal is likely utilized as a drinking site. Roosting habitat is not likely on-site based on this species' specific requirements, although buildings may provide marginal day roosting habitat (The Wildlife Project, 2022). Further investigation would be needed to determine the suitability and use of park facilities. Auditory observations of the species have been made during winter and summer monitoring at the SVRA, most recently in summer 2021 (The Wildlife Project, 2022).

Ribbed Cryptantha

Ribbed cryptantha (*Johnstonella costata* aka *Cryptantha costata*) is a member of the Boraginaceae family native to California. The species is an annual herb that blooms between January and May in desert dunes and scrub, typically in sandy locations. The species is low water tolerant, needing an average annual precipitation of three to seven inches. Ribbed cryptantha typically grows 10-20 centimeters and often has a red-purple root. It is very bristly on the stem, leaves, inflorescence, and flowers. CNPS ranks this species a 4.3, meaning it is on a watch list due to its limited distribution in the state but is not considered very threatened at this time.

Heber Dunes SVRA contains suitable habitat for the species, and *Cryptantha* species have been observed previously in 2017. There are multiple species of *Cryptantha* that have the potential to occur within the SVRA (Appendix 1). Field identification can be difficult, and many species often require observation of nutlets and hairs at strong magnification to distinguish (Baldwin and Jepson Herbarium, 2002). The three species that may occur at Heber Dunes SVRA can reasonably be identified using a dichotomous key. Tom Chester's dichotomous key for the Borrego Valley is recommended (Chester, 2012; Chester, 2019). Based on park records, it is not possible to identify what species has been previously observed at the SVRA.

2.4.4 Additional Focused Assessment Elements

2.4.4.1 Non-native Invasive (Exotic) Species

There are currently two non-native invasive species of management concern at Heber Dunes SVRA. While these species currently have limited distributions, they have the potential to spread rapidly under select environmental conditions, can compete with native species for available resources, and can alter the habitat. Other non-native species are present on-site, including athel tamarisk (*T. aphylla*), which currently are not of management concern.

Due to the park's location near agricultural fields and regional roadways, invasive plants have the potential to spread within the park. A collaborative effort between park and district staff is needed to help identify and manage potential problems.

Russian Thistle

Russian thistle (*Salsola* spp.; formerly considered singular *Salsola tragus*) is a common weed throughout California, particularly in drier regions. It grows best on loose sandy soils and establishes in agricultural land, roadsides, and other disturbed places. It is a profusely branched annual herb with an efficient taproot, abundant seed production, and has a reduced leaf surface (Goeden, n.d.). This species is commonly called tumbleweed because mature plants break off at ground level and become windblown. These windblown plants are flammable and may hinder traffic.

This species was observed for the first time within Heber Dunes SVRA in the summer of 2021. A park maintenance worker identified the plant on the northern section of the perimeter road, removed it, and notified district resource staff. In total, ten plants were found parallel to Heber Road. This species has a variable tendency to spread, and staff should monitor the park to assess additional measures that may be required. Currently, opportunistic hand pulling appears appropriate control.

Saltcedar

Saltcedar (*Tamarix ramosissima*) is highly invasive throughout the southwest, typically found as a perennial, deciduous shrub, or small tree. This species tends to establish along disturbed and undisturbed streams, riverbanks, desert springs, and flood plains; seedlings require saturated soil to establish (USFS 2010). While saltcedar may be used by some species for nesting, it can also diminish habitat quality. Saltcedar can increase soil salinity, lessen microbial activity, resulting in drier soils under dense stands, and is capable of rapid spread and expansion (USFS, 2010).

This species is scattered throughout the park and historically has been minimally managed as it has not exhibited invasive tendencies (i.e., rapid spread and deterioration of habitat quality). Staff should continue to monitor saltcedar within the SVRA to assess if management intervention is required, particularly if environmental conditions or agricultural usage off-site changes.

2.4.4.2 Sensitive Aquatic Habitats

No sensitive aquatic habitats or watercourses are present within Heber Dunes SVRA. Based on the 2011 General Plan, no wetland or riparian features were identified on-site. The adjacent South Alamo Canal is concrete lined with no significant seepage to create a wetland habitat. The canal is an important component of the habitat at Heber Dunes SVRA as it provides a source of perennial water. No special-status species are known to reside in the canal, and no run-off is known to occur to any adjacent water bodies.

2.4.4.3 Wildlife Movement

Due to the amount of fragmentation and agricultural conversion around Heber Dunes SVRA, it is anticipated that the park may be used by wildlife as a limited corridor. As the park is not connected to other natural or semi-natural habitats, species moving through the area may opt to use agricultural fields as more prey and water sources are present. Wildlife movement is not considered of significance at the SVRA.

2.5 Climate Change

The earth's climate is changing rapidly due to anthropogenic factors that result in increased greenhouse gas emissions, primarily carbon dioxide. The effects of climate change include long-term shifts in temperature and precipitation and increase the frequency and magnitude of extreme weather events. Strategies to respond to climate change include mitigation and adaptation actions. Mitigation actions target the reduction of greenhouse gas emissions or their removal from the atmosphere. Adaptation actions target reducing the specific impacts caused by climate change on the landscape.

For vegetation and wildlife to successfully adapt, organisms require healthy, connected landscapes that allow shifts in behavior, distribution, and - on a longer timeframe - evolutionary processes to operate unimpeded (Chambers et al. 2019; Seavy et al. 2009). For organisms to respond to the rapid rate of climate change on an evolutionary level, they require a landscape that supports their biology and population dynamics (Bonnet et al. 2022).

The most important climate adaptation strategy for natural resource land managers is the recovery and protection of healthy, connected ecosystems (Seavy et al. 2009). Healthy ecosystems are more resilient to the short-term and long-term effects of climate change (Gunderson 2000; Scheffer et al. 2001). Ecosystems with high ecological connectivity (e.g., connectivity within a habitat type, between different ecotones, upstream/downstream through elevation gradients, horizontally on to floodplains) allow movement and resource exchange across the landscape.

The WHPP addresses climate adaptation for species and ecosystems through removing stressors and restoring ecosystem connectivity, structure, and function. This will allow natural resources to better adapt to primary (e.g., changes in temperature, precipitation, river flow?) and secondary (e.g., stream hydrology, fire) effects of climate change. The adaptive management approach of this WHPP provides the opportunity to understand the response of natural resources to changes in environmental conditions from climate change as well as changes in response to management through mitigation and adaptation actions.

2.6 Management Units

Resource Management Units (MUs) provide a structure for implementing natural resource management activities. MUs have defined land areas with unique identifiers that constitute manageable-sized areas for organizing and scheduling management work. For the WHPP, organizing, describing, and planning habitat management and ongoing maintenance is described for each MU within a SVRA.

2.6.1 Description of Management Units

Three MUs have been defined for Heber Dunes SVRA (Figure 9). The delineation of MUs was based primarily on vegetation community differences and the presence of the South Alamo Canal (CDPR 2021).

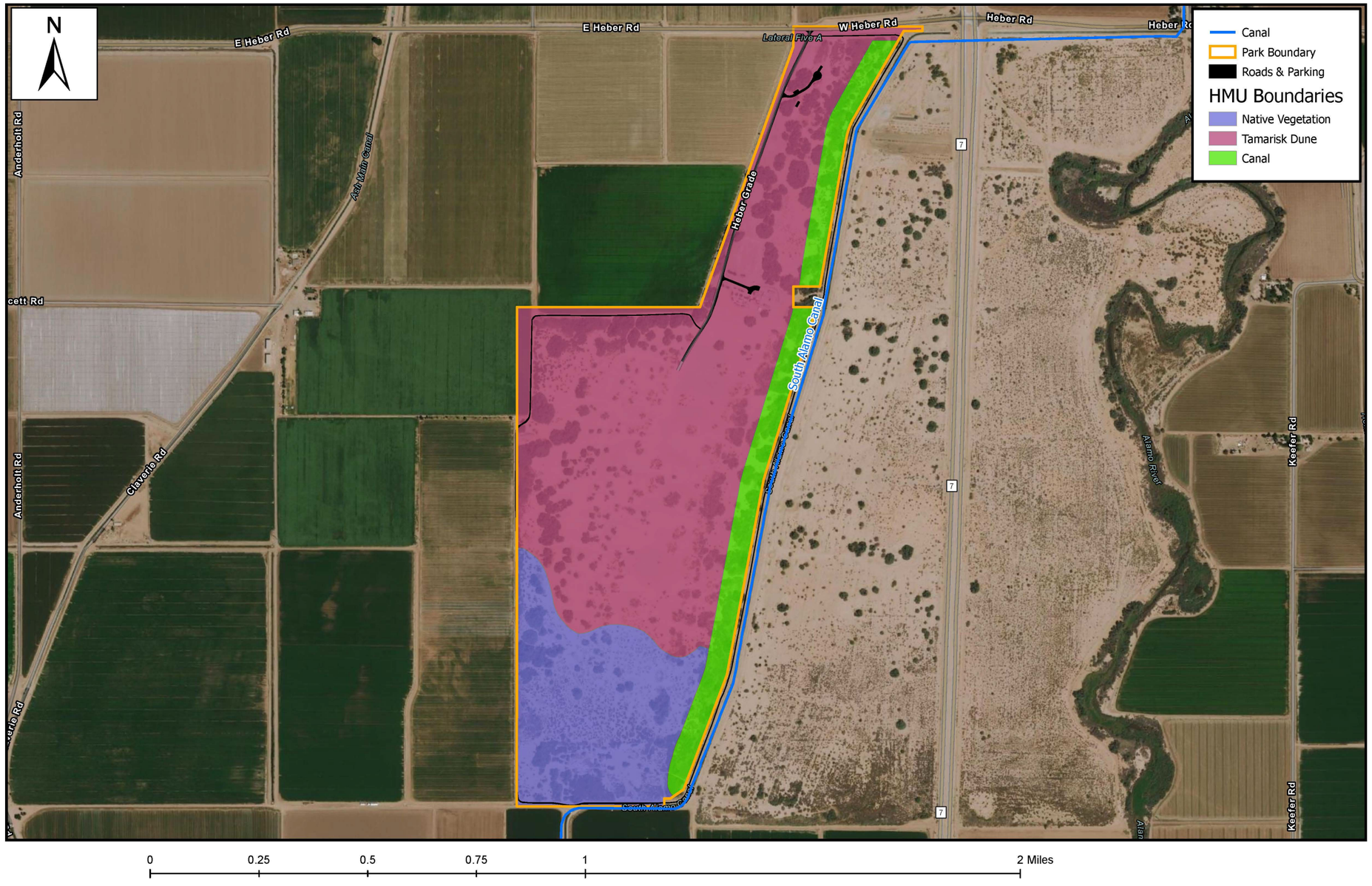

Figure 9. There are three Management Units delineated at Heber Dunes SVRA.

2.6.1.1 Canal MU

The Canal Zone MU comprises a 100-foot buffer along the eastern portion of the SVRA, capturing the perimeter and easement roads along the South Alamo Canal and a handful of OHV trails that connect riders back to the primary riding area. The MU is zoned for open riding, but riding is mostly contained to the maintained canal frontage roads and social trails connecting the frontage road to the park interior due to vegetation density. These frontage roads are also regularly used by IID and, to a lesser extent, SDG&E staff during maintenance.

Primary vegetation communities in this area consist of Athel tamarisk and dense arrow weed/baccharis. At the southern end of the MU, arrow weed/saltbush communities are dominant. The canal typically is filled with water, although it is drained a few days each year for maintenance. The presence of perennial water is unique in a desert setting. The Canal Zone MU is 39.7 acres.

2.6.1.2 Native Vegetation MU

The Native Vegetation MU is dominated by creosote and saltbush scrub in loamy and sandy soils. The General Plan identifies this portion of the park (the Native Vegetation MU is referred to as the Resource Management Zone in the 2011 General Plan) as the area with the highest quality creosote scrub habitat and other natural resources within the unit. The General Plan found that this area could be operated as a trail-only area; however, no park-designated travel routes are currently established. A network of social trails runs through the MU. Primary management concerns are reducing disturbance to native vegetation, enhancing existing native habitat and resources, managing weeds, restoring duplicate and degraded secondary trails, providing access to other portions of the SVRA, and clear signage that indicates zone boundaries.

There are no day-use facilities in this MU. A utility easement runs diagonally through the MU, with three towers currently installed and outside interest in the future expansion of utility facilities. The Native Vegetation MU is 75.4 acres.

2.6.1.3 Tamarisk Dunes MU

Athel tamarisk and barren, stabilized dunes dominate the Tamarisk Dunes MU. A few palm trees are present to the north of this MU, as well as some just outside the park's western boundary. This area is designated as an open riding area and is popular for riding/staging OHVs. Day use facilities are scattered throughout the MU, and these areas are often used for family picnics, with a portion of the group riding while others recreate near shade ramadas. The Tamarisk Dunes MU is the largest MU at 225.5 acres.

In the 2011 General Plan, six different zones overlap with the MU; three zones are recreational, two are for facilities, and one is a multi-purpose recreational and day-use facility zone. Goals for

this MU consider recreational opportunities (both OHV and non-OHV), interpretive opportunities, and safety and resource controls implementation.

3 CONSERVATION AND IMPROVEMENT GOALS AND OBJECTIVES

3.1 STATUTORILY REQUIRED STATE AND REGIONAL CONSERVATION OBJECTIVES

PRC §5090.32(g) requires that WHPPs be developed in consideration of statutorily required state and regional objectives. Conservation objectives are a central tool in planning and implementing effective resource management. Following a review of state and regional conservation plans, it was determined that there are no statutorily required state or regional conservation guidelines that directly apply to Heber Dunes SVRA. However, state and regional conservation goals that are broadly applicable to the park unit that will be discussed in this section.

3.1.1 State Conservation Objectives

3.1.1.1 State Wildlife Action Plan

The State Wildlife Action Plan (SWAP), developed by CDFW in concert with several partners statewide, provides a blueprint for wildlife conservation and habitats in the context of a growing human population and a changing climate. One of the priority goals of the Plan is to maintain and improve ecological conditions vital for sustaining ecosystems in California by, in part, improving ecosystem connectivity and community structure. This 2022 WHPP supports these SWAP goals by conserving and improving wildlife habitat over time within the SVRA.

The SWAP has divided the state of California into seven provinces and developed regional conservation strategies for each. Heber Dunes SVRA falls within the Colorado Desert Ecoregion of the Desert Province, with one identified conservation target, Sparsely Vegetated Desert Dune habitat, relevant to the park.

The five goals listed for Sparsely Vegetated Desert Dune in the 2015-2025 SWAP are:

- Increase acres where native species are dominant by at least 5%,
- Maintain or increase acres of habitat by at least 5%,
- Increase acres of habitat with suitable soil characteristics regimes by at least 5%,
- Increase acres of habitat with desired groundwater levels by at least 5%, and
- Increase acres of habitat with desired connectivity by at least 5%.

Several of these goals would be supported with the Heber Dunes SVRA WHPP, particularly the second goal to maintain existing habitat. As a SVRA, the park meets the SWAP objective to maintain acres of habitat.

3.1.1.2 Safeguarding California Plan

Developed by the California Natural Resources Agency, the updated 2018 Safeguarding California Plan's purpose is to lay out guidelines for how agencies can incorporate strategies necessary to address climate change into their future planning efforts. The 2018 update included a chapter specific to California State Parks and conservancies, chapter PC-5, and included the following recommendation to incorporate climate change in all state park planning and decision-making. To meet the chapter PC-5 recommendation, the plan identifies the steps to prioritize conservation, protection, and restoration of natural resources in climate change adaptation projects and planning to ensure sustainable recreational opportunities for the public. The Heber Dunes WHPP can contribute to this plan by conserving and improving habitat, which is a component of sustainable recreation at the park unit. Recreational activities at the park are generally defined by the 2011 General Plan.

3.1.1.3 California Biodiversity Initiative

California is a recognized global biodiversity hotspot. In 2017, a group of scientific experts from across the state developed the "Charter to Secure the Future of California's Native Biodiversity," a call to action on biodiversity conservation that prompted Governor Brown to launch the California Biodiversity Initiative in 2018. The Biodiversity Initiative incorporated biodiversity protection into the state's economic and environmental goals and work. In 2020, Governor Newsom furthered the cause by tasking the California Natural Resources Agency with forming the California Biodiversity Collaborative. This group would continue where the Biodiversity Initiative left off and introduce a new goal for the state to conserve thirty percent (30%) of California's land and coastal waters by 2030 (sometimes referred to as the 30 by 30 Initiative). The Heber Dunes WHPP will broadly support this initiative by conserving wildlife habitat.

3.1.2 Regional Conservation Objectives

3.1.2.1 Imperial County General Plan

While State Parks is not subject to or required to comply with the Imperial County General Plan, the objectives listed within the plan were considered during the development of the WHPP objectives. The County's General Plan balances land use policies and programs throughout the county while considering socioeconomics, resource management, development density, and many other factors. Of relevance to the WHPP is the County's Conservation and Open Space Element. This portion of the General Plan considers resource management for ecological, development suitability, public health, and sensitive resource values. The Element was updated in 2014 and adopted in 2016.

The Conservation and Open Space Element identifies nine broad conservation goals, of which the following will be supported either directly or indirectly by the 2022 Heber Dunes WHPP:

- Conserve resources through land use decisions and public education,
- Conserve critical habitats for their integrity, function, production, and long-term viability,
- Preserve cultural resources,
- Conserve, protect, and enhance water resources,
- Actively seek to improve regional air quality, and
- Maintain open space for aesthetics, natural resources, recreational opportunities, and minimize hazards to human activity.

3.2 Conservation and Improvement Objectives for Heber Dunes SVRA

The Public Resources Code provides the goals to be achieved through the WHPPs. Specifically, PRC §5090.35(c)(1) calls for the Division to "…prepare a wildlife habitat protection plan that conserves and improves wildlife habitats for each state vehicular recreation area." While the PRC defines "conserve" and "restoration," the broader definition of these terms used in the field of conservation biology are more appropriate for other purposes. To capture industry standards, the WHPP defines conservation as the protection and sustainment of resource values at existing conditions over time, and restoration as improvement in the quality or extent of resource values from existing conditions over time.

Development of objectives requires delineation of MUs and an assessment of ecological conditions within each MU. Additionally, it is important to consider goals and objectives from other internal and external plans and conservation priorities in developing park-specific objectives. Objectives have been designed to be S.M.A.R.T., where feasible, meaning they have been designed to be specific, measurable, achievable, realistic, and timely. The use of S.M.A.R.T. goals is compatible with the requirement of WHPPs to incorporate BAS.

If new monitoring programs are established through the WHPP or baseline data is insufficient, objectives may not currently meet the S.M.A.R.T. threshold. Anticipated timelines and data needs for developing S.M.A.R.T. objectives are addressed under each applicable objective's monitoring discussion. Once developed, these updated objectives will be addressed in the WHPP annual report.

Some pressures and stressors can impact and modify an environmental setting within every habitat. Management actions proposed within the WHPP will interact and drive changes to both pressures and the environmental setting itself. The effects of these interactions will then be assessed and used to consider the further use of management actions as part of an adaptive management loop (Figure 10).

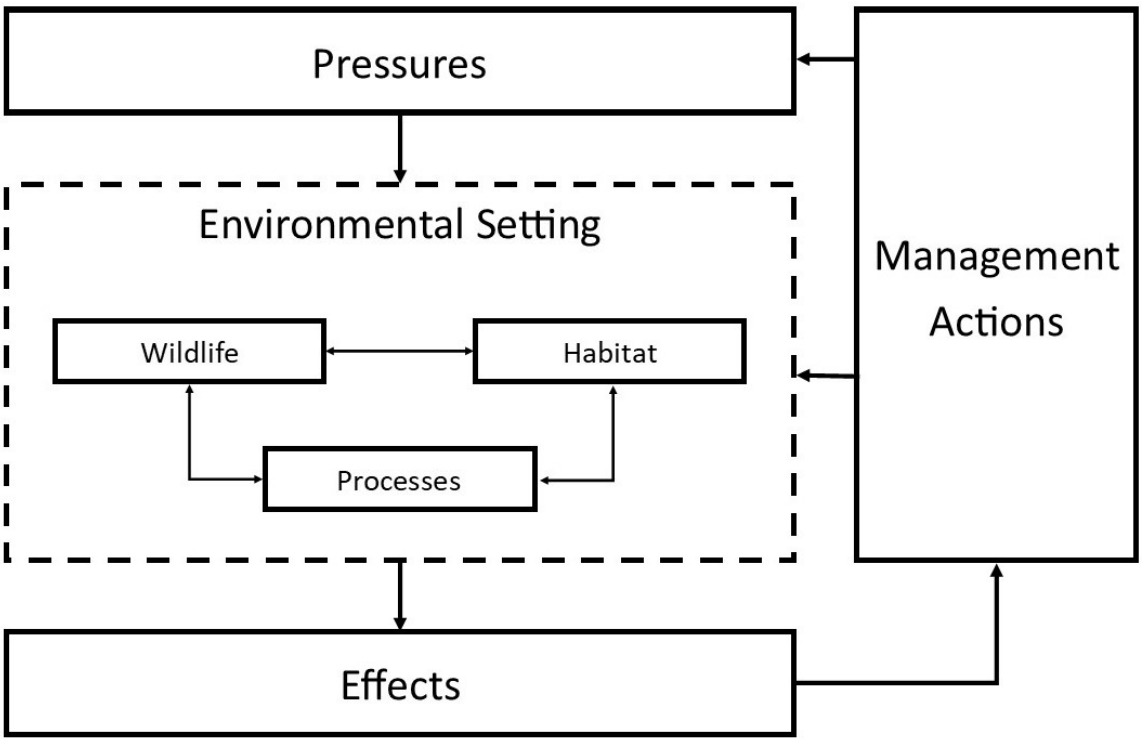

Figure 10. Conceptual model demonstrating the connectivity between the natural and physical environment to management actions. Adapted from Atkinson et al., 2004.

3.2.1 Conservation and Improvement Objectives

The PRC goals of resource conservation and improvement are achieved through setting resource objectives that target the protection and maintenance of the existing extent and condition of the specific soils, plants, wildlife, and habitats within a SVRA (Table 1 and Table 2). Furthermore, improvement and restoration objectives target improving conditions or re-establishing specific soils, plants, wildlife, and habitats within a SVRA. It is important to note that while these resource categories were identified from the language in the PRC, due to their interrelated nature, it is likely that there will be overlap amongst categories.

Setting objectives for conservation and improvement requires assessing existing conditions, quantitatively identifying resources of concern, and identifying clear management or monitoring actions that reevaluate resource conditions over time. Annual monitoring evaluates the efficacy of management actions that seek to achieve these targets.

3.2.1.1 Conservation Objectives

As defined in the WHPP, conservation objectives are tied to long-term protection of the resources within a park unit and were developed in consideration of information assembled within the natural resource assessment. These objectives target the protection and/or maintenance of the existing extent and condition of the specific soils, plants, wildlife, and habitats within a SVRA. As part of the adaptive monitoring cycle, monitoring data provide information about the efficacy of management actions undertaken to achieve this goal.

Goal 1. Conserve native vegetation communities at Heber Dunes SVRA long-term.

- **Habitat, Soil and Vegetation Conservation Objective 1 (HCO1, SCO1, and VCO1).** Over the next five years, conserve the existing 92 acres of native vegetation communities throughout Heber Dunes SVRA.

A key focus of the WHPP is to maintain existing vegetation communities at the SVRA as vegetation has wide-ranging benefits to all resource conditions. Vegetation presence and health is beneficial to habitats in numerous ways, such as reducing erosion and providing stability, reducing moisture loss, and promoting biodiversity. Similarly, soil plays a key role in the condition and presence of vegetation in habitats, primarily by providing structure for rooting plants and as a source for nutrients and moisture. This objective will be accomplished by assessing community-level changes park-wide and monitoring changes to landcover within the Native Vegetation MU.

Heber Dunes SVRA is a unique environmental setting as it contains healthy remnant native vegetation communities in an area that has primarily been converted to agriculture. Soils in portions of the park provide suitable habitat for these native species to grow. Additionally, the non-native Athel tamarisk communities are also important to the park as they play a critical role in holding down dunes that would otherwise become windblown.

Goal 2. Conserve sensitive native wildlife at Heber Dunes SVRA long-term.

- **Wildlife Conservation Objective 1 (WCO1).** Verify and conserve special-status wildlife species within Heber Dunes SVRA over the next five years.

Wildlife conservation objectives focus on protecting special-status species that are known and suspected to occur at the park. Baseline conditions are not well understood for this objective currently. To allow for the establishment of baseline data, targets will be defined in 2024. Generally, targets will focus on understanding and maintaining the quality and health of special-status species present at the unit.

3.2.1.2 Restoration Objectives

The PRC restoration goal is achieved by setting objectives that target the improvement of resource conditions or re-establishment of the specific soils, plants, wildlife, and habitat within a SVRA. Again, these objectives are connected to the park's adaptive management, with monitoring assessments completed to determine the success of actions.

Goal 3. Improve habitat for native vegetation throughout Heber Dunes SVRA long-term.

- **Soil and Vegetation Restoration Objective 1 (SRO1 and VRO1).** By 2027, remove five acres of saltcedar from Heber Dunes SVRA.

Native vegetation can be impacted by invasive species in a variety of ways, including by outcompeting native species for resources, ability to rapidly spread, and altering the environment to inhibit other species. There are two known invasive species that pose management concern currently: saltcedar and Russian thistle. Saltcedar is known to be dominant in 25 acres within the SVRA, while not much is known about Russian thistle. Early efforts to control invasive plants will generally focus on saltcedar or emerging species of concern. Saltcedar has the potential to increase soil salinity in areas adjacent to where it grows, which can inhibit native species from growing. The removal of this species from the park will not decrease existing salinity levels but will reduce future deposition.

Goal 4. Improve wildlife habitat quality throughout Heber Dunes SVRA over time.

- **Wildlife and Habitat Restoration Objective 1 (WRO1 and HRO1).** Reduce micro-trash present on-site by 2027.

A focused effort on managing and reducing micro-trash will be beneficial to park wildlife and improve overall habitat quality. While trash can accumulate park-wide, the Athel tamarisk in the Tamarisk Dunes MU trap high quantities of windblown debris. Trash can be harmful to wildlife and should be removed from the system.

This objective will be achieved through clean-up events. Specific targets will be developed per clean-up event and reported within annual reports.

Table 1. Conservation Objectives for Heber Dunes SVRA

Category	Objective	Management Actions	Monitoring
Habitat, Soils, Vegetation	HCO1, SCO1, and VCO1. Over the next five years, conserve the existing 92 acres of native vegetation communities throughout Heber Dunes SVRA.	Limit significant expansion of social trails (i.e., interpretive signage, temporary closures, etc.) within the Native Vegetation MU. Manage spread of invasive species with chemical and mechanical controls throughout the unit.	Update VegCAMP maps for the park every five years. Use Normalized Difference Vegetation Index (NDVI) to analyze changes in land cover within the Native Vegetation MU every two years.
Wildlife	WCO1. Verify and conserve special-status wildlife species within Heber Dunes SVRA over the next five years.	Use avoidance measures (i.e., avoidance buffers, seasonal restrictions on work, exclusion zones, etc.) to minimize impacts to special-status species. When burrowing owl are observed on site, Mitigation Measure Biology-1 (AECOM 2011) will be employed.	Conduct pre-construction surveys for breeding birds and /or rare plants in appropriate seasons. Conduct annual burrowing owl presence-absence surveys at the SVRA. Identify potential bat roost locations and conduct annual assessments for evidence of roosting beginning in 2023.

Table 2. Improvement Objectives for Heber Dunes SVRA

Category	Objective	Management Actions	Monitoring
Soils, Vegetation	SRO1 and VRO1. By 2027, remove five acres of saltcedar from Heber Dunes SVRA.	Plan and implement small-scale projects such as invasive plant removal, planting native vegetation, and scrubbing volunteer trails.	Use NDVI to analyze changes in land cover within the Native Vegetation MU every two years. Conduct EDRR surveys to identify and respond to invasive plants every other year.
Wildlife, Habitat	WRO1 and HRO1. Reduce micro-trash present on-site by 2027.	Hold up to two clean-up events at Heber Dunes SVRA annually, beginning in 2023.	Track locations of treated areas and weight of removed debris following every event.

3.3 MANAGEMENT ACTIONS

The goals and objectives identified in the WHPP are intended to guide the management of natural resources at Heber Dunes SVRA. Management actions are responses that can be taken to improve habitat, reduce impacts to habitat, respond to triggers, and attempt to reach success criteria, all with the intention of moving toward habitat goals and objectives. These actions are informed by the SVRA's resource objectives, success criteria, and management triggers.

The adaptive management process allows flexibility in incorporating management actions as the scale of understanding or uncertainties changes. The effectiveness or need for implementation of these management actions will be informed by a monitoring program. Therefore, management and monitoring are connected in a feedback loop into a decision-making process about the SVRA's resource management.

The management actions listed below are connected to the goals and objectives identified in Section 3.2.2, Table 1, and Table 2. A full list of management actions can also be found in Appendix 2.

3.3.1 Heber Dunes SVRA Conservation and Restoration Management Actions

1. Limit significant expansion of social trails (i.e., use of interpretive signage, route signage, temporary closures, etc.) within the Native Vegetation MU.

This management action is associated with HCO1, SCO1, and VCO1. It will be triggered if the significant expansion of new social trails is detected within the Native Vegetation MU. Potential management responses include interpretive messaging, route signage, temporary closures, and vertical mulching. The MU will be aerially monitored, with NDVI analysis, to show changes in vegetation cover over time. Baseline data is currently not defined, and management thresholds will be established by 2025. Successful implementation of this management action would result in maintained disturbance levels to the Native Vegetation MU.

2. Manage spread of invasive species with chemical and mechanical controls throughout the unit.

This management action is associated with HCO1 and VCO1. It will be triggered when known or emerging invasive species expand within the unit. Potential management responses include interpretive messaging, chemical or mechanical treatment, and implementation of an EDRR program. Unit-wide monitoring will consist of combined VegCAMP and EDRR methodology to show changes in the extent of invasive plant species over time. Baseline data is currently limited to VegCAMP assessments and anecdotal information. A better understanding of baseline conditions is anticipated by 2025. Successful implementation of this management

action would result in the maintenance or reduction of invasive plant species throughout the unit.

3. Use avoidance measures (i.e., avoidance buffers, seasonal restrictions on work, exclusion zones, staff training, etc.) to minimize impacts to sensitive resources (as defined within §2.4.3 and §2.4.3.1).
4. When and if burrowing owl are observed on-site, Mitigation Measure Biology-1 (AECOM 2011) will be employed. Mitigation Measure Biology-1 states:

> "In the event that western burrowing owl are discovered within a construction area or in an area that interferes with operation and management of Heber Dunes SVRA, CDFG [*sic*] will be consulted to determine the proper course of action, which may include avoidance or measures such as limiting construction to the nonbreeding season, burrow exclusion outside of the breeding season, collapsing of excluded burrows, and the creation of artificial burrows" (AECOM 2011).

These management actions are associated with WCO1. The detection of a sensitive (i.e., state or federal endangered or threatened species, burrowing owl, or CNPS 3+ ranked species) species in the SVRA would trigger management action. Potential management responses include the establishment of avoidance buffers, seasonal restrictions or avoidance of work, exclusion zones, and staff training.

If a burrowing owl is detected, CDFW would be consulted to determine the appropriate response. Based on the natural resource assessment, several sensitive species are known or have the potential to occur at Heber Dunes SVRA. However, further refinement of areas of use and seasonality is needed. Additionally, baseline conditions will need to be developed for specific projects at the unit. Successful implementation of this management action would result in conserving sensitive species at the unit over time and minimize impacts during construction projects.

5. Plan and implement small-scale projects such as invasive plant removal, planting native vegetation, and scrubbing volunteer trails.

This management action is associated with SR01 and VRO1. Specific restoration projects would be planned when deteriorated conditions are identified in the unit. Potential management responses include invasive plant removal, planting native vegetation, and scrubbing volunteer trails. No specific projects or actions have been currently identified but monitoring over the next five years may identify work. Once identified, projects would be evaluated consistent with CEQA, and standard district avoidance measures would be incorporated into the project design, as appropriate. When projects are identified or proposed, management thresholds and success criteria will be determined.

6. Hold up to two clean-up events at Heber Dunes SVRA annually, beginning in 2023.

This management action is associated with WRO1 and HRO1. Two clean-up events will be held annually beginning in 2023 to control accumulated non-organic trash and micro trash. Event advertisement will be focused on local communities, and may include schools, civic organizations, user groups, and other stakeholders. Beyond the clean-up events, potential management responses include interpretive messaging or programs, and informal clean-up events. The extent and location of clean-up events will be the primary tracking method associated with this management action. However, the weight of accumulated trash may be used as an event-specific metric to show success. Management thresholds will be established per event; park-wide conditions are currently not well understood, but wind-blown trash frequently accumulates under dense tamarisk stands and vegetated thickets. Successful implementation of this management action would result in decreased trash on-site.

3.4 MONITORING PROGRAM

A natural resource assessment (Section 2.4) is the initial assessment within a monitoring program, allowing periodic evaluation of the condition of resources and informing adaptive management within the SVRA. A monitoring program also identifies and documents a set of performance indicators that demonstrate progress and achievement of the objectives defined in Section 3.2.2. Performance indicators are evaluated at regular intervals, and results are used in the adaptive management approach to inform future management of targeted resources. In addition to a performance indicator-driven monitoring program, other monitoring provides relevant information to park management that does not directly tie to a management action.

This section contains a list of resource monitoring at Heber Dunes SVRA to meet new PRC mandates. A summary of monitoring focuses, the goal of monitoring, how it informs monitoring, and how it ties to the WHPP objectives is included below. Additional details on monitoring can be found in Appendix 3.

3.4.1 Objective-driven Monitoring

Monitoring listed in this section is tied to objectives and management actions, with established performance indicators that allow for success to be assessed as part of the adaptive management process. Performance indicators evaluate the effects of management actions on targeted natural resources. The following section discusses how the performance indicator is linked to the targeted resource, identified objective, and management actions that will be implemented to meet the objective. To meet BAS guidance, performance indicators have been based on robust and accepted methods, have clear linkage with the question or hypothesis being evaluated, and have well-documented methods and treatment of bias, uncertainty, gaps, and limitations.

A metric, baseline, and target for each monitoring focus have been identified. For the WHPP, a metric is a measurable parameter measured to provide information about the effects of a management action of concern. Baseline is the existing resource condition determined through BAS. Understanding of baseline informs the development and success of management actions. A target is the S.M.A.R.T. objective identified for resource conservation or improvement that can be measured against the baseline to show success.

3.4.1.1 VegCAMP Surveys

VegCAMP updates will be completed every five years, coinciding with WHPP updates. VegCAMP uses the Manual of California Vegetation to establish a hierarchical classification of vegetation on a fine scale. Data is evaluated through aerial imagery and strict protocols established by CDFW; then, field surveys assess accuracy. These surveys provide a spatial inventory of vegetation communities throughout the park. See Appendix 3 for further information.

- **Metric:** CDFW's VegCAMP protocol will categorize fine-scale vegetation communities and their extent (in acres) throughout the SVRA.
- **Baseline:** VegCAMP aerial surveys were first completed in 2021 for Heber Dunes SVRA; on-the-ground surveys occurred in spring 2022. This survey effort will serve as the baseline for future assessments. Six vegetation alliances were mapped within the SVRA, along with two non-vegetative landcover types (Figure 8). The vegetation alliances include:
    - arrow weed thickets shrubland alliance (31 acres),
    - creosote bush scrub shrubland alliance (52 acres),
    - quailbush scrub shrubland alliance (5 acres),
    - bush seepweed shrubland alliance (4 acres) and
    - tamarisk thickets semi-natural shrubland alliance (168 acres total; Athel tamarisk accounts for 143 acres while saltcedar covers 25 acres).
- **Target:**
    - By 2027, maintain existing 92 acres of native vegetation communities throughout Heber Dunes SVRA.
    - By 2027, remove five acres of saltcedar from Heber Dunes SVRA.

3.4.1.2 Invasive Weed Monitoring

Monitoring invasive weeds will occur opportunistically and through established protocols at Heber Dunes SVRA. Currently, two invasive species of management concern are identified at the unit, including Russian thistle and saltcedar. Outside of VegCAMP surveys, dedicated mapping has not occurred, so there is a potential that other invasive species are present at the park, and the extent of invasive species is not well documented. EDRR protocols will be utilized to map, remove, and monitor invasive species. See Appendix 3 for further information.

- **Metric:** The extent (in acres) of invasive plants at the SVRA will be spatially mapped by species.
- **Baseline:** Two invasive species of concern have been identified in the unit. Dedicated mapping has not yet occurred; however, VegCAMP surveys captured areas that one of the species is present. That species, saltcedar, was mapped in 25 acres of the SVRA (Figure 8). Unit-wide baseline assessments will be completed by 2025 and will serve as baseline for future work.
- **Target:**
    - By 2027, remove five acres of saltcedar from Heber Dunes SVRA.

3.4.1.3 NDVI Landcover Changes in Native Vegetation MU

Native vegetation is important to Heber Dunes SVRA as it is remnant habitat in the region. Most of the native vegetation is located within the Native Vegetation MU. The General Plan identified that the vegetation in this area has some sensitivity as a remnant habitat and, while the area is managed as an open ride area, recognized that reducing future disturbance is desirable (AECOM, 2011a). The General Plan also noted erosion at the base of some vegetation within the Native Vegetation MU.

Staff will utilize NDVI to identify the landcover characteristics, including percent vegetation coverage, of the Native Vegetation MU. Changes in cover over time will be assessed to identify whether disturbance, shown through loss of percent vegetation coverage unassociated with natural effects, is increasing or decreasing within the MU. NDVI mapping will occur every two years. When vegetation loss is identified, VegCAMP data will be utilized to inform the specific native communities that are impacted. This data will guide management and restoration efforts within the Native Vegetation MU. A State Parks protocol, initially developed for Prairie City SVRA, will be utilized. See Appendix 3 for further information.

- **Metric:** NDVI will be used to identify changes in landcover, particularly the percent vegetation cover, within the Native Vegetation MU.
- **Baseline:** NDVI has not been utilized within the Native Vegetation MU to map disturbance. The first efforts will establish baseline landcover values and percent cover. The baseline will be established in 2025.
- **Target:** Targets will be established by 2025, following the availability of initial baseline data.

3.4.1.4 Sensitive Species Avoidance Monitoring

One goal of the Heber Dunes SVRA WHPP is to protect and conserve sensitive species. While several sensitive species are known to occur, and others have the potential to occur, not much is directly known about their behavior and presence within the SVRA. Most of the known sensitive species at the park unit are either bats or birds. There is one sensitive plant species as

well. Ongoing monitoring of taxa at the unit will provide information about the presence or absence of these species and, in time, can inform the seasonality and usage of the park.

Bats

An inventory of bats at Heber Dunes SVRA began in 2019 using acoustic recordings. Early efforts showed that numerous bats were at least seasonally foraging or migrating through the SVRA, including several species of special concern. Due to the relatively sparse dataset, the inventory will continue for several years to provide additional context on species' seasonality and potential to occur. As previously discussed, acoustic surveys since 2019 indicate that 13 bat species, including seven SSC, have been observed at the SVRA.

In addition to the inventory, a better understanding of bats' utilization of Heber Dunes SVRA will be important to ongoing park management. Locations within the SVRA identified as potential roost sites, such as buildings and palm trees, will be surveyed during key times of year to identify if bats or their sign are present. District staff will work with Division consultants to develop or select a protocol to conduct roost assessments at Heber Dunes SVRA by 2023. The implementation of this protocol will allow for baseline conditions to be understood. See Appendix 3 for more information.

Birds

Burrowing owls have the potential to be present within Heber Dunes SVRA, although they are more frequently observed outside the SVRA in agricultural fields. It is important to understand the potential use of the SVRA by burrowing owl. Staff will modify protocols and procedures from CDFW's 2012 Staff Report on Burrowing Owl Mitigation to assess presence, absence, and map utilized habitat within the SVRA. CDFW's protocol requires an initial habitat assessment, surveys, and an impact assessment. These protocols have been adapted as they were primarily developed for use during construction projects, and the SVRA is known to contain burrowing owl habitats. See Appendix 3 for further information.

In addition to burrowing owl, other sensitive bird species have the potential to be present seasonally or reside within the SVRA. Pre-construction surveys would occur during the species' breeding seasons to identify if nests are present within the project area and if present, ongoing monitoring of nests during construction activities would occur. These surveys would allow baseline conditions to be established for individual projects. See Appendix 3 for further information.

Plants

One sensitive plant species, ribbed cryptantha, has the potential to occur in the area, although it has not been identified in the SVRA. Due to the challenges in identifying this species, regular

surveys are not proposed; however, pre-construction surveys would occur during the species' bloom period, February to May, to flag avoidance zones around *Crypthantha* spp. in or near the project area. See Appendix 3 for further information.

Sensitive Species Avoidance Monitoring

- **Metric:** The presence or absence of a sensitive species or its sign.
- **Baseline:** Baseline conditions vary by taxon and methodology; see appendix 3 for further discussion.
    - Bat
        - Inventory: 13 total bat species observations, including seven sensitive species were auditorily observed at Heber Dunes SVRA from 2019 to 2020.
        - Roosting: Baseline data will be gathered beginning in 2023. Baseline conditions will be established by 2024.
    - Bird
        - Burrowing Owl: Burrowing owl are known to be present within the SVRA on occasion. Annual presence and absence will be determined through monitoring.
        - Pre-construction: Baselines will be established for individual projects and identified within annual reports.
    - Plant
        - Pre-construction: Baselines will be established for individual projects and identified within annual reports.
- **Target:** Targets will be established by 2024 following the availability of initial baseline data. Project-specific targets will be established as needed and reported on in the WHPP annual report.

3.4.1.5 Track Clean-Up Event Success

Heber Dunes SVRA is surrounded by low-lying agricultural fields and regional roadways. As winds blow through the area, trash tends to collect at the base of vegetation, particularly tamarisk, in the unit. This trash reduces overall habitat quality and may pose a risk to wildlife. While opportunistic clean-up occurs on-site, the organization and implementation of larger public clean-up events will result in greater impact. Prior to clean-up events, staff would document areas in need and then reassess the condition of those prioritized areas following the clean-up. In addition to tracking conditions of cleaned areas, the weight of trash bags would be measured. Volunteer hours would be maintained through short-term volunteer records. See Appendix 3 for further information.

- **Metric:** The location of treated areas in the SVRA.

- **Baseline:** A well-established baseline does not exist; however, staff has anecdotal knowledge about the density and frequency of build-up in certain locations around the unit. A better understanding of conditions will be established through the WHPP, particularly as clean-up events begin in 2023.
- **Target:**
    - This objective will be achieved through clean-up events. Specific targets will be developed per clean-up event and reported within annual reports.

3.4.2 Scientific Research

Scientific research consists of monitoring work that provides relevant management information but does not have a direct nexus with the effect of management actions on natural resources. Performance indicators have not been established for scientific research as the monitoring is not tied directly to a management action.

3.4.2.1 Taxa Monitoring

Periodic taxa monitoring (i.e., avian, reptile, small mammal, and vegetation) will provide an understanding of wildlife populations present at Heber Dunes SVRA and periodic updates to the species inventory, as appropriate. While some monitoring may occur regularly, not all taxa are well represented or easy to sample at the unit, so dedicated surveys may occur periodically to help inform the species inventory. Avian and small mammal surveys, focusing on species richness and evenness, have historically occurred twice per year. Reptile and vegetation surveys have occurred sporadically and poor sampling efforts that have produced limited data. All data would provide information on background ecological processes occurring at the SVRA, regardless of current conservation and improvement goals and objectives.

Avian survey protocols are currently being revised to utilize autonomous recording units, ideally reducing observer bias and increasing auditory observations. These surveys will continue to occur annually as methodology is field-tested.

3.4.2.2 Weather Data

Understanding local weather trends is an important element of analyzing habitat monitoring data. The nearest official weather station to the park is in El Centro, CA, approximately nine miles west of the SVRA. With the distance, there was concern that the El Centro dataset may not fully capture specific weather within the SVRA. A weather station was installed within the maintenance yard at Heber Dunes SVRA in fall 2021. The weather station collects data on precipitation, daily temperature, relative humidity, wind speed and direction, and gust speed. District staff periodically collects data and imports it into the habitat monitoring database. Annual reports will contain a section on observed weather.

4 EVALUATE AND ADAPT

4.1 REPORTING

An annual report will be produced to provide a "snapshot" of current resource conditions and describe the management actions implemented for natural resources in the previous year. This report will also discuss plans for the upcoming year's resource management. Annual reports provide one-year updates and progress reports to the overall goals of the WHPP. OHMVRD will review these reports to evaluate the Heber Dunes SVRA WHPP.

4.2 ADAPTIVE MANAGEMENT DECISIONS

4.2.1 Matrix Management and Chain of Command

The Ocotillo Wells District uses the Department Standard District Structure identified in Department Operations Manual 0202. Within Park Operations, the district falls under the Desert Division. However, aspects of district managed SVRAs, such as review and approval of the WHPP, also fall under the jurisdiction of OHMVRD and NRD. A District Superintendent is responsible for the district operations, and a core team of program managers is responsible for their respective programs (Figure 11). Core district programs include administrative services, facilities management, interpretation and education, public safety, resources, and service driven. While program managers are tied to specific disciplines and programs, it is important for cross-discipline and matrix management to occur as no program exists solely independent of others.

For the purposes of the WHPP, the district's resources department will primarily be responsible for implementation, although other district programmatic efforts will be required. For example, certain management actions call for the use of interpretive signage, which would be executed in conjunction with the interpretation program. Additionally, the district's core team will be part of the district approval process of the WHPP.

4.2.1.1 Approval for WHPP-Identified Management Actions

As management actions included in the WHPP have previously been reviewed by the district, OHMVRD, and NRD, implementation of any adaptive management strategy identified in the WHPP is to be approved by the district's Resource Program Manager and reported to the District Superintendent. Implemented management actions will be discussed in annual WHPP reports.

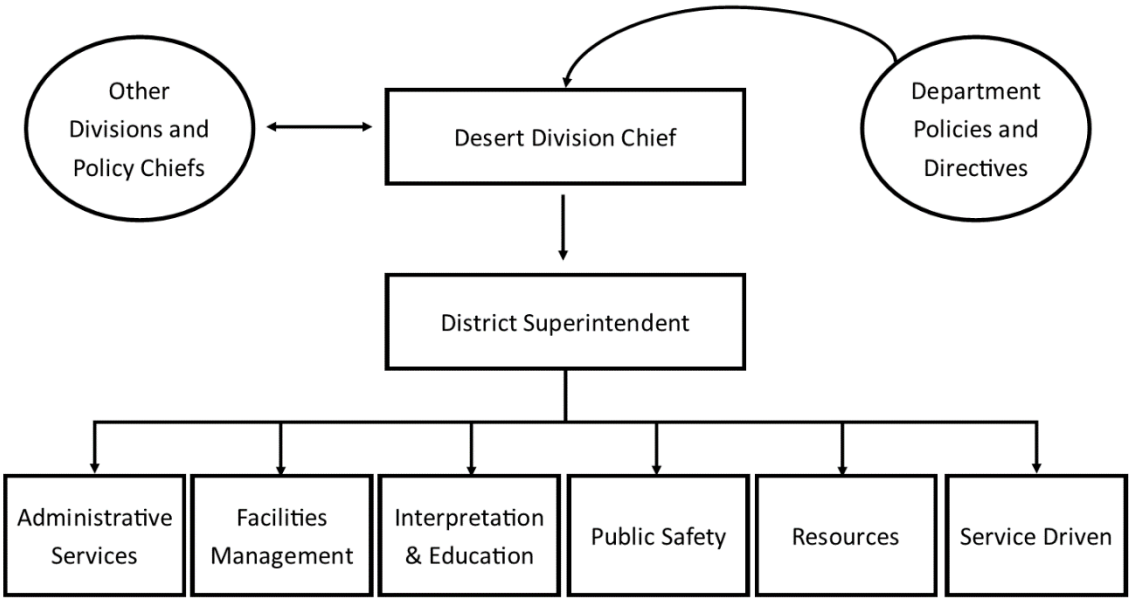

Figure 11. Overview of district chain of command.

4.2.1.2 Approval for Modified or New Management Actions

The management actions presented within the WHPP offer a comprehensive overview of all the management actions currently being used to manage the SVRA's natural resources. The presented management actions may be expanded or modified, and new management actions may be developed based on monitoring results. Adaptive management actions not outlined and approved by the WHPP will follow a different process for review and implementation. Modified and new management actions are to be categorized as low-level or high-level, depending on the scale or level of change to the current WHPP, resources program, and park unit. Any modified or new management action would follow Department policies found within the Department Operations Manual or relevant Departmental Notices.

Low-level management actions can be performed with little to no impact on the SVRA's recreation or WHPP. Implementation of low-level management actions is to be approved by the district's Resource Program Manager and reported to the District Superintendent. Additionally, low-level management actions would be reported in the annual WHPP report. The use of low-level management actions allows for resources staff to act and respond quickly to changes in the adaptive management strategies of their parks. Examples of low-level actions include closing a gate or removing incipient invasive plants.

High-level management actions are adaptive management decisions that require more thought, approval, and implementation and that may negatively impact the park's recreation activities or

result in broader changes to the current WHPP. High-level management decisions will require the approval of the district's Resource Program Manager and District Superintendent. These management decisions should be reported to OHMVRD and NRD and included in the WHPP annual report. Examples of high-level management decisions include closing sections of the SVRA for restoration or starting a new management program (e.g., grazing, controlled burn, etc.).

4.2.2 Reporting Guidance

4.2.2.1 Annual WHPP Report

Annual WHPP Reports will be used to capture the full natural resources program over the previous year, including adaptive management decisions, project implementation, and monitoring results. Annual WHPP Reports serve as a review of the application of the habitat management strategy and adaptive management approach of the SVRA.

Reports at a minimum will include the following:

- The resources goals, and objectives for the prior year.
- An analysis and review of the prior year's monitoring data results.
- The SVRA's management triggers from the prior year.
- All management action decisions implemented during the past year and a review of their level of success and ability to inform management decisions.
- Plans, goals and objectives for monitoring and management within the coming year.

4.2.2.1.1 Report Review Process

WHPP Annual Reports are to be reviewed within State Parks' Chain of Command. This includes SVRA, District, Division, and Department. After review at the SVRA and District levels, WHPP Annual Reports are to be sent to OHMVRD and NRD technical team staff for review to determine if the goals and objectives established by the SVRA's 2022 WHPP are being met.

4.2.2.1.2 Report Timing

WHPP Annual Reports will be submitted annually to OHMVRD and NRD resources staff following the review process defined above. Report generation, program review, and district review should be completed annually, with final reports submitted to OHMVRD and NRD by March 31st, following the year to which the annual report applies.

5 CONSTRAINTS

Constraints are factors that may limit staff's ability to meet the goals and objectives identified in the WHPP. While the WHPP considered many of these elements during development, the

likelihood of any given constraint or constraints occurring is unknown and impossible to account for. Potential constraints are discussed below to provide information about different situations that may arise; however, if a constraint were to impact staff's ability to meet WHPP goals and objectives, further discussion about the specific constraint or constraints would be incorporated into annual reporting.

5.1 Annual Weather Cycles

Annual weather cycles are an important driver of environmental conditions, and they can be highly variable. Drought conditions are a source of stress to the system, while wet seasons can boost wildlife populations and result in annual wildflower blooms. Monitoring and management can be affected by these weather cycles.

Annual vegetation can require specific conditions (i.e., above average precipitation, mild temperatures) to grow, and many species can remain dormant in the seed bank until these conditions are met. Similarly, above or below average temperatures can pose a mortality risk to animals during live trapping. While monitoring efforts maintain some level of flexibility in consideration of weather, it can be a challenge to time work appropriately or maintain a full park inventory if weather conditions are not suitable. Similarly, some management actions, such as restoration, could be less effective or require additional monitoring or action in drought conditions to ensure project success.

Due to the importance of annual weather cycles at Heber Dunes SVRA, a weather station has been installed at the unit. The weather station allows staff to better understand current trends at the SVRA to inform progress on WHPP goals and objectives. Still, this understanding does not negate the challenge associated with certain weather cycles.

5.2 Legal or Regulatory Obligations

Heber Dunes SVRA operates under several existing legal obligations. These existing requirements and potential future legal or regulatory obligations may change or redirect staff priorities. For example, if the language of PRC §5090 were to change or a species were to be listed, staff would need to temporarily reprioritize efforts and consider whether an update to the WHPP is appropriate to meet these new commitments. The decision to update a WHPP outside the five-year update cycle would be determined in conjunction with OHMVRD and NRD.

5.3 Operational Limitations

Operational limitations include financial obligations and staff capacity. These limitations may arise at any level within the state, not just from Heber Dunes SVRA or the district. Financial constraints may arise with competing district priorities, recessions, budget cuts, or other district funding or funding sources changes. Depending on the scale of the financial constraint, staff will

need to reprioritize efforts, which may alter the capacity to meet annual targets laid out in the WHPP.

Similarly, staffing at Heber Dunes SVRA is extremely limited, and district staff will primarily be responsible for meeting WHPP goals and objectives. These efforts do require at least opportunistic support from unit staff and administrative support from district staff. As direct changes to unit or district staff occur, staff capacity maybe reduced, and challenges will arise in meeting annual targets. When these challenges arise, staff will consider the use of statewide assistance or contracts to bolster staffing capacity and consider reprioritizing efforts from non-mandated and non-emergency projects.

5.4 Stochastic Events

Stochastic events are unpredictable events that may impact resources, land, or divert resources that would've otherwise been directed towards management. Examples of stochastic events include natural events such as storms and earthquakes and human-generated events such as plane crashes and hazmat events. Impacts from stochastic events may be either short or long duration.

5.5 Other Constraints

The constraints listed above are not intended as a comprehensive list as a variety of constraints could impact staff's ability to meet WHPP goals and objectives, rather as a sample of potential constraints that may arise. If any other constraint arose, it would be documented appropriately within an annual report.

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7 APPENDIX 1: SPECIES INVENTORY

Table 3. Heber Dunes SVRA Species Inventory.

The list was generated using park data and external records. CNDDB, CNPS RarePlants, and IPac were searched using a nine USGS quad 7.5' Quadrangle search on May 27, 2021. Due to the SVRA's proximity to Mexico, only six quads (Bonds Corner, Calexico, El Centro, Heber, Holtville West, and Holtville East) returned data. A report of native plants at the SVRA was generated in Calscape on June 6, 2021. iNaturalist and eBird supplemented these datasets.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Anaxyrus woodhousii Woodhouse's toad	Amphibian	None	None	N/A	IUCN: LC	Moist environments include irrigation ditches, canyons, and swamps.	Lays eggs in shallow, slow-moving, ephemeral bodies of water.	Moderate	Yes	Suitable habitat for this species is not present within the SVRA; however, adjacent properties have suitable habitat and irrigation canals surrounding most of the SVRA. However, many of the adjacent fields have been fallowed for several years. Within the past couple years, fields have been in use. This species has several observations around the SVRA and was last observed by park staff in 2002.
Incilius alvarius Sonoran Desert toad	Amphibian	None	None	N/A	CDFW: SSC IUCN: LC	Breeds in temporary pools and irrigation ditches along the Colorado River and southern Imperial Valley.	N/A	None	No	Per CNDDB, Sonoran Desert toad is presumed extirpated in this region. Two records were listed from 1912, but no recent observations are included. No suitable habitat is present within the SVRA or adjacent lands.
Lithobates pipiens northern leopard frog	Amphibian	None	None	N/A	CDFW: SSC IUCN: LC	The native range is east of Sierra Nevada-Cascade Crest. Near permanent or semi-permanent water in a variety of habitats.	Highly aquatic species. Shoreline cover submerged and emergent aquatic vegetation are important habitat characteristics.	None	No	CNDDB notes that the 1929 observation was of transplanted individuals outside their native range. Suitable habitat is not found within the SVRA or adjacent property as no aquatic habitat is present, and the park is located well outside of the native range.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Lithobates yavapaiensis lowland leopard frog	Amphibian	None	None	N/A	BLM: S CDFW: SSC IUCN: LC	Found along the Colorado River and in streams near the Salton Sea.	N/A	None	No	Suitable habitat for this species is not present at the SVRA or adjacent properties. According to CNDDB, this species is considered extirpated in California.
Hadrurus arizonensis desert hairy scorpion	Arthropod	None	None	N/A	N/A	Wide range of habitats from dunes to rocky hillsides.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA. Park staff last documented observation of this species on 4/5/2017.
Accipiter cooperii Cooper's hawk	Bird	None	None	N/A	CDFW: WL IUCN: WL	Forest and woodlands adapted to disturbed areas with trees.	Prefers to nest in tall trees with extensive canopy cover.	High	Yes	Suitable habitat for this species is present in the SVRA and surrounding area. The SVRA is in the nonbreeding range of the species, although it is close to the year-round range. Utility towers within the SVRA could potentially be used for nesting, although they are not ideal. This species was last observed in the SVRA on 10/9/2018.
Aechmophorus clarkii Clark's grebe	Bird	None	None	N/A	USFWS: BCC	Nests in inland freshwater lakes and marshes; occupy nearshore marine waters in winter.	Builds floating nests sheltered from waves near water's edge among emergent vegetation, typically reeds or rushes.	Low	No	Suitable habitat for this species is not present at the SVRA or adjacent properties. There are no park records of this species.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Aeronautes saxatalis white-throated swift	Bird	None	None	N/A	IUCN: LC	Broad. Breeds mainly in dry mountains, canyons; locally on sea cliffs (California).	For nesting, require crevices but have adapted to human-modified environments, using highway overpasses, quarries, buildings, and bridges.	High	Yes	Suitable habitat for foraging is present both within the SVRA and adjacent lands. The park is outside of the breeding range of this species. Frequent flyover observations occur during park surveys. This species was most recently observed by park staff on 9/29/2020.
Agelaius phoeniceus red-winged blackbird	Bird	None	None	N/A	IUCN: LC	Broad. Agricultural fields, cattle lots, sloughs, ditches, rivers, lake edges, and marshes.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and adjacent agricultural fields. Observations by park staff primarily are of flyovers. The last observation within the SVRA was on 9/30/2020.
Amphispiza bilineata black-throated sparrow	Bird	None	None	N/A	IUCN: LC	Desert scrub dominated by Joshua tree, Mojave yucca, cholla, and other spiny plants on well-drained rocky or gravelly soils.	Around the Salton Sea, habitat islands of nonnative tamarisk and suburban areas with planted trees. Occasional use of desert scrub dominated by quail brush or dense weed fields, often dominated by Russian thistle.	High	Yes	Poor quality habitat for this species is present at the SVRA. Preferred vegetation and soils are not found on-site or in nearby agricultural fields. The park acts as a habitat island, like other habitats used by this species around the Salton Sea. The park is within the year-round range for this species. Staff last observed this species within the SVRA on 10/1/2020.
Ardea alba great egret	Bird	None	None	N/A	CDF: S IUCN: LC	Freshwater, brackish, and marine wetlands. Forage in shallow water, salt or fresh, including partially flooded fields.	Nests in partially submerged snags; nests are frequently over water with banks of cattail near the nest tree.	Moderate	Yes	There are no suitable species for this habitat within the SVRA. Adjacent property may serve as a foraging habitat when partially flooded. Park staff regularly observe flyovers, with the most recent observation on 9/30/2020.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Artemisiospiza belli Bell's sparrow	Bird	None	None	N/A	IUCN: LC	Breed in coastal sagebrush, chaparral, and other open, scrubby habitats.	Winters in dry shrublands or grasslands, including creosote and saltbush-dominated desert scrub, yucca, honey mesquite, and greasewood.	Moderate	No	Suitable year-round habitat is present within the SVRA, less so on adjacent property. There are no records of this species within the SVRA. This species is difficult to distinguish from *Artemisiospiza nevadensis*.
Artemisiospiza nevadensis sagebrush sparrow	Bird	None	None	N/A	IUCN: LC	Shrubsteppe habitats consist of shrubs approximately 6 feet tall, especially big sagebrush, as well as saltbush, rabbitbrush, shadscale, and bitterbrush. Typically, below 5,600 feet elevation.	Winters in dry shrublands or grasslands, including creosote and saltbush-dominated desert scrub, yucca, honey mesquite, and greasewood.	Moderate	No	Suitable wintering habitat is present within the SVRA, less so in adjacent property. The SVRA is within the nonbreeding range of this species. There are no records of this species within the SVRA. This species is difficult to distinguish from *Artemisiospiza belli*.
Athene cunicularia burrowing owl	Bird	None	None	N/A	CDFW: SSC BLM: S CDFW: SSC IUCN: LC USFWS: BCC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation.	Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	High	Yes	Suitable habitat for this species is present at the SVRA, although adjacent agricultural fields are preferred. Burrowing owl have been observed nesting at HDSVRA occasionally and may forage on site. This species was last observed by district staff within the SVRA in 2017.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Auriparus flaviceps verdin	Bird	None	None	N/A	IUCN: LC	Arid desert scrub or chaparral with thorny trees. Avoid open flats with low vegetation and dense forest.	Prefers mesquite, catclaw, blue palo verde, and smoke tree but has adapted to use tamarisk for nesting.	High	Yes	Suitable habitat for this species is present at the SVRA but not on adjacent property due to agricultural conversion. The park is within this species' year-round range, and park staff frequently observe it. The most recent observation within the SVRA was on 9/29/2019.
Bubo virginianus great horned owl	Bird	None	None	N/A	IUCN: LC	Broad. Secondary-growth woodlands, swamps, orchards, and agricultural areas, as well as a wide variety of deciduous, coniferous, or mixed forests.	Nest in cottonwood, mesquite thickets, and nonnative palms.	High	Yes	Suitable habitat is present at the SVRA, and the park is within the year-round range of this species. Minimal preferred trees for nesting are on site. The most recent observation within the SVRA was on 4/17/2018.
Bubulcus ibis cattle egret	Bird	None	None	N/A	IUCN: LC	Coastal barrier islands, marshes, reservoirs, lakes, quarries, swamps, riverside woodlands, and upland forests.	Around the Salton Sea, forage in agricultural and flooded fields.	Moderate	No	Suitable habitat is not present within the SVRA, but adjacent agricultural fields are suitable for foraging. The park is within the year-round range of this species. Observations primarily consist of flyovers or the use of nearby agricultural fields. Cattle egrets were most recently observed on 10/3/2019 as a flyover.
Buteo jamaicensis red-tailed hawk	Bird	None	None	N/A	IUCN: LC	Open habitat. Desert, scrubland, grassland, roadsides, fields and pastures, parks, broken woodland, and (in Mexico) tropical rainforest.	N/A	High	Yes	Suitable habitat is present within the SVRA and adjacent land. The park is within the year-round range. This species has been observed nesting in utility towers within the SVRA. The most recent SVRA observation was on 10/1/2020.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Buteo regalis ferruginous hawk	Bird	None	None	N/A	CDFW: WL IUCN: LC USFWS: BCC	Open grasslands, sagebrush flats, desert scrub, low foothills, and fringes of pinyon and juniper habitats.	Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	Moderate	No	Foraging habitat is present in the SVRA; minimal nesting habitat is present within the park and adjacent property. Utility towers within the SVRA have been used for nesting by other hawk species and may be utilized by this species when available. This species winters in southern California, and the SVRA is outside the breeding range. Per CNDDB, in 2003, a FEHA was observed near El Centro.
Callipepla gambelii Gambel's quail	Bird	None	None	N/A	IUCN: LC	Thorny and brushy vegetation throughout the Sonoran, Chihuahuan, and Mojave deserts, as well as parts of the Great Basin.	Common near water sources for drinking and bathing.	High	Yes	Suitable habitat is present within the SVRA, but surrounding agricultural fields are likely avoided. The park is within the year-round range of this species. The most recent observation within the SVRA was on 9/30/2020.
Calypte costae Costa's hummingbird	Bird	None	None	N/A	USFWS: BCC	Sonoran and Mojave Desert scrub, coastal California chaparral and sage scrub, and deciduous forest and desert scrub in Baja California, Mexico	In the Sonoran Desert, occur in desert washes with palo verde, jojoba, desert lavender or chuparosa, on steep rocky slopes, and in lowlands with saguaro, creosote bush, and cholla cacti below 3,000 feet elevation.	High	Yes	Suitable habitat for this species is present at the SVRA, and COHU has been observed during staff surveys in the past. This species was most recently observed by district staff on 10/3/2019. iNaturalist lists a 2014 record outside the park along State Route 7.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Cardellina pusilla Wilson's warbler	Bird	None	None	N/A	IUCN: LC	Willow, alder, and shrubby thickets near streams up to about 11,500 feet elevation.	Forests and scrubby areas along streams during migration.	High	Yes	Suitable habitat for this species is present within the SVRA but not in adjacent agricultural fields. The SVRA is within the migration path for this species. Staff observed this species last on 4/6/2020.
Cathartes aura turkey vulture	Bird	None	None	N/A	IUCN: LC	Open areas include mixed farmland, forest, and rangeland. Roost in trees, on rocks, and other high, secluded spots.	N/A	High	Yes	The SVRA contains suitable habitat for this species and is within the year-round range. Nearby agricultural fields provide better foraging opportunities, and there are minimal roost sites within the SVRA. This species is frequently observed by park staff, typically flying over the SVRA, most recently on 9/30/2020.
Charadrius montanus mountain plover	Bird	None	None	N/A	CDFW: SSC USFWS: BCC	Winters in shortgrass habitat, tilled or harvested farm fields, alkaline flats, and coastal prairies.	Agricultural fields and overgrazed landscapes that mimic preferred shortgrass habitats may be utilized.	Low	No	Suitable habitat for this species does not exist within the SVRA; however, this species has been observed wintering in adjacent agricultural fields. Minimal foraging opportunities may occur within the SVRA, although agricultural fields are likely sufficient to support wintering populations.
Charadrius vociferus killdeer	Bird	None	None	N/A	IUCN: LC	Open areas such as sandbars, mudflats, grazed fields, and golf courses. Tolerates dry areas.	Generally, the vegetation inhabited by this species is no taller than one inch.	Moderate	No	Suitable habitat for this species does not exist within the SVRA, but adjacent agricultural lands are known to be used by this species. The park is within the year-round range of this species.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Chordeiles acutipennis lesser nighthawk	Bird	None	None	N/A	IUCN: LC	Deserts, areas with scrubby vegetation, dry washes, and agricultural fields. Generally, occur at lower elevations but have been reported up to 4,000 feet elevation in Texas.	Typical breeding habitat is xeric desert scrub, far from water and dominated by saltbush. Frequently roost in Athel tamarisk.	High	Yes	Suitable habitat is present for this species within and adjacent to the SVRA. The park is within the breeding range of this species. The most recent park observation was on 4/17/2018.
Circus hudsonius northern harrier	Bird	None	None	N/A	CDFW: SSC IUCN: LC	Coastal salt & freshwater marsh. Nest and forage in grasslands, from salt grass in the desert sink to mountain cienagas.	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	High	Yes	Suitable habitat for this species is present in and adjacent to the SVRA. The park is within the nonbreeding range of this species. Most recently, this species was observed on 9/29/2020.
Colaptes auratus northern flicker	Bird	None	None	N/A	IUCN: LC	Woodlands, forest edges, and open fields with scattered trees, as well as city parks and suburbs.	Will occupy any large tree, native or not. This includes Athel tamarisk.	High	Yes	Suitable habitat is present within the SVRA, but adjacent lands are not suitable. The park is within the winter range of this species, and the most recent observation was on 10/8/2018.
Columba livia rock dove	Bird	None	None	N/A	IUCN: LC	Urban areas, farmland, and rocky cliffs.	N/A	High	Yes	Suitable habitat is present adjacent to the SVRA as this species commonly uses agricultural lands in the region. The most recent observation within the park was on 10/1/2020.
Contopus sordidulus western wood-peewee	Bird	None	None	N/A	IUCN: LC	Open woodlands, forest edges, and forests near streams, from sea level to around 10,000 feet elevation.	Prefers tall trees, native or nonnative, often perching on exposed snags or below the crown.	High	Yes	Suitable habitat is present within the SVRA. The park is within the migratory path of this species. The most recent observation within the park was on 10/2/2019.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Corvus corax common raven	Bird	None	None	N/A	IUCN: LC	Broad. Coniferous and deciduous forests, beaches, islands, chaparral, sagebrush, mountains, desert, grasslands, agricultural fields, tundra, and ice floes.	N/A	High	Yes	Suitable habitat is present within the SVRA and surrounding land. The park is within the year-round range for this species. This species is regularly observed by staff, most recently on 9/29/2020.
Elanus leucurus white-tailed kite	Bird	None	None	N/A	IUCN: LC	Savannas, open woodlands, marshes, desert grasslands, partially cleared lands, and cultivated fields.	Tend to avoid heavily grazed areas.	Moderate	No	Suitable habitat for this species is present within and around the SVRA. The park is outside this species' range, but there are regional observations from eBird to the south and west of the SVRA. This species has not been observed within the park.
Empidonax difficilis Pacific-slope flycatcher	Bird	None	None	N/A	IUCN: LC	Shady coniferous and mixed woodlands, especially in places near water where the canopy is partly open.	Migrants tend to remain within relatively closed habitats and, in Imperial County, seem partial to Athel tamarisk.	High	Yes	Suitable habitat for this species is present within the SVRA, and the park is within the migration path. The most recent observation within the SVRA was on 4/9/2020.
Eremophila alpestris horned lark	Bird	None	None	N/A	IUCN: LC	Prairies, deserts, tundra, beaches, dunes, heavily grazed pastures, plowed fields.	Favor bare, dry ground and areas of short, sparse vegetation; avoid areas where grasses grow more than a couple inches tall.	High	Yes	Suitable habitat for this species is present within the SVRA, and the park is within the year-round range of this species. This species was previously observed during avian surveys at the unit, last on 2/14/2017.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Euphagus cyanocephalus Brewer's blackbird	Bird	None	None	N/A	IUCN: LC	Grasslands, marshes, meadows, woodland, coastal scrub, chaparral, sagebrush, and human-created habitats such as golf courses, agricultural fields, and power line rights-of-way.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and adjacent agricultural fields. Observations by park staff primarily are of flyovers. The last observation within the SVRA was on 9/30/2020.
Falco columbarius merlin	Bird	None	None	N/A	CDFW: WL IUCN: LC	Seacoast, tidal estuaries, open woodlands, savannahs, edges of grasslands & deserts, farms & ranches.	Clumps of trees or windbreaks are required for roosting in open country.	High	Yes	Suitable habitat for this species is present within the SVRA, and the park is within the nonbreeding range of the species. The last observation in the SVRA was on 4/18/2018.
Falco sparverius American kestrel	Bird	None	None	N/A	IUCN: LC	Open areas with short ground vegetation and sparse trees. Meadows, grasslands, deserts, parks, farm fields, cities, and suburbs.	Attracted to human-modified habitats, such as pastures and parkland.	High	Yes	Suitable habitat for this species is present within the SVRA and adjacent agricultural fields. The park is within this species' year-round range, and observations are regular during avian surveys. The last observation within the SVRA was on 10/1/2020.
Gallinula galeata common gallinules	Bird	None	None	N/A	IUCN: LC	Freshwater and brackish marshes, ponds, and lakes have a mix of submerged, floating, and emergent aquatic vegetation and are open water year-round.	Will use artificial aquaculture ponds, rice fields, sewage lagoons, and urban stormwater retention ponds.	Low	No	Suitable aquatic habitat for this species does not occur within or adjacent to the SVRA. The park is in the year-round range and is close to the migration path for this species. The adjacent canal may be used as a temporary stop while in transit. One flyover was observed by park staff on 9/29/2020.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Gelochelidon nilotica gull-billed tern	Bird	None	None	N/A	USFWS: BCC	Winters in salt marshes, estuaries, lagoons, and plowed fields, less frequently along rivers, around lakes, and in freshwater lakes.	Breeds on gravelly or sandy beaches.	Low	No	Suitable habitat for this species does not exist within the SVRA or adjacent to the park. The park is just outside of the known range of this species, although there are regional observations outside of the known range. There are no park or CNDDB records of this species in the vicinity of the SVRA.
Geococcyx californianus greater roadrunner	Bird	None	None	N/A	IUCN: LC	Semi-open, scrubby habitat from below sea level to nearly 10,000 feet elevation. Habitats include areas dominated by creosote, mesquite, chaparral, and tamarisk, as well as grasslands, riparian woodlands, and canyons.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA, and the park is within the year-round range. The most recent observation at the park occurred on 10/1/2019.
Geothlypis tolmiei MacGillivray's warbler	Bird	None	None	N/A	IUCN: LC	Open woodlands with a rich understory or scrub community.	Migrants utilize habitats with lots of underbrush, especially near water.	High	Yes	Suitable habitat is present within the SVRA, and the park is within the migration path of this species. The most recent observation at the SVRA occurred on 10/1/2020.
Haemorhous mexicanus house finch	Bird	None	None	N/A	IUCN: LC	Dry desert, desert grassland, chaparral, oak savannah, streamsides, and open coniferous forests at elevations below 6,000 feet.	Tolerant of disturbed areas.	High	Yes	The SVRA contains suitable habitat for this species and is within the year-round range. This species is frequently observed by park staff, most recently on 9/29/2020.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Hirundo rustica barn swallow	Bird	None	None	N/A	IUCN: LC	Open grasslands, including suburban parks and fields, agricultural fields, beaches, and over open water, ranging from sea level to 10,000 feet elevation.	Breeding habitat must include open areas for foraging, structures or cliffs for nesting, and a source of mud for nest material.	Moderate	No	Suitable migration habitat is present within the SVRA, and the park is within the migration path of this species. Staff commonly report observing flybys of this species. The most recent observation was on 4/7/2020.
Junco hyemalis dark-eyed junco	Bird	None	None	N/A	IUCN: LC	Coniferous and deciduous forests. During migration and winter, habitats include open woodlands, fields, roadsides, parks, and gardens.	N/A	High	Yes	Suitable migration habitat is present within and around the SVRA. The park is in the non-breeding range. Staff last observed this species on 2/14/2017.
Lanius ludovicianus loggerhead shrike	Bird	None	None	N/A	CDFW: SSC IUCN: LC USFWS: BCC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, riparian woodlands, desert oases, scrub & washes.	Prefers open country for hunting, with perches for scanning and dense shrubs and brush for nesting.	High	Yes	Suitable habitat for this species is present within the SVRA, and the park is within the year-round range of this species. This species has previously been observed during avian surveys at the unit, most recently on 10/1/2020.
Leiothlypis celata orange-crowned warbler	Bird	None	None	N/A	IUCN: LC	Shrubs and low-growing vegetation in riparian settings, patches of forest, and chaparral.	N/A	High	Yes	The park is within the migration path for this species, and migrants may utilize the SVRA as suitable habitat is present. The most recent observation was on 9/28/2020.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Leiothlypis ruficapilla Nashville warbler	Bird	None	None	N/A	IUCN: LC	Shrubby, second-growth forests.	Migrants will utilize most brushy habitats, and western populations frequent drier habitats, such as desert flats and washes in fall.	High	Yes	The park is within the migration path for this species, and migrants may utilize the SVRA as suitable habitat is present. The most recent observation was on 4/11/2019.
Limosa fedoa marbled godwit	Bird	None	None	N/A	USFWS: BCC	Breeds in shortgrass prairies near wetlands, avoiding areas with taller vegetation. Winter along coastal mudflats, estuaries, and sandy beaches.	Prefers native grass prairies with green needlegrass, western wheatgrass, blue grama, needle-and-thread, and little blue stem.	Low	No	Suitable habitat for this species does not exist within the SVRA or in nearby adjacent habitats. The park is within the migratory range of this species. There are no park or CNDDB records of this species in the vicinity of the SVRA.
Melanerpes uropygialis Gila woodpecker	Bird	None	None	N/A	USFWS: BCC	Arid environments, especially deserts and dry forests.	Most common in low swales and arroyos, including riparian corridors with cottonwood, willow, and mesquite.	Low	No	Marginal habitat for this species is present within the SVRA. While Gila woodpeckers have been observed to nest in Athel tamarisk, this is not ideal habitat for this species. Due to the conversion of native habitat to agriculture, the area surrounding Heber Dunes SVRA offers minimal habitat for this species. Neither CNDDB nor park records have observations of this species in the vicinity. iNaturalist records show this species was observed in Mexicali, approximately 10.9 miles south of the SVRA, in 2020.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Melozone aberti Abert's towhee	Bird	None	None	N/A	IUCN: LC	Cottonwood-willow riparian forest with a dense understory of native shrubs and mesquite woodlands along the Colorado River.	Adapting to use stands of tamarisk, ornamental landscaping with sufficient understory, and agricultural areas lined with quailbush.	High	Yes	Suitable habitat for this species is present within the SVRA. The park is within the year-round range for this species, and it has been observed on many occasions. The most recent observation was on 9/30/2020.
Mimus polyglottos Northern mockingbird	Bird	None	None	N/A	IUCN: LC	Open ground with shrubby vegetation, such as hedges, fruiting bushes, and thickets.	Prefers grassy areas over the bare ground for foraging.	High	Yes	Suitable habitat for this species is present within the SVRA and vicinity. The park is within the year-round range of this species. The most recent observation at the SVRA occurred on 10/1/2020.
Molothrus ater brown-headed cowbird	Bird	None	None	N/A	IUCN: LC	Grasslands with low and scattered trees and woodland edges, brushy thickets, fields, prairies, fields, pastures, orchards, and residential areas.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and vicinity. The park is located where the year-round and breeding ranges intersect. This species has been observed in the park and overhead. The most recent observation was on 4/9/2020.
Myadestes townsendi Townsend's solitaire	Bird	None	None	N/A	IUCN: LC	Open woodlands and forests, particularly with juniper trees and tall pines.	Winter in desert washes, open hillsides, and shrublands if fruits are available.	High	Yes	Marginal wintering habitat for this species is present within the SVRA. The park is just outside the known nonbreeding range for this species, but there are a few regional records. This species was observed in the park most recently on 4/21/2007.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Myiarchus cinerascens ash-throated flycatcher	Bird	None	None	N/A	IUCN: LC	Dry scrub, open woodlands, and deserts from sea level to 9,000 feet elevation.	N/A	High	Yes	Suitable habitat for this species is present in the SVRA. The park is within the year-round range for this species, and the most recent observation was on 4/9/2020.
Numenius americanus long-billed curlew	Bird	None	None	N/A	USFWS: BCC	Breeds in grasslands of the Great Plains and Great Basin; winters in wetlands, tidal estuaries, mudflats, flooded fields, and beaches.	N/A	Low	No	Suitable habitat for this species does not exist within the SVRA or in nearby adjacent agricultural fields. The park is within the migration path of this species, and staff regularly record flybys. iNaturalist lists a 2021 record of this species in Calexico, approximately 1.455 miles southwest of the park's southern boundary. The last flyover observation of this species was on 9/29/20 at the SVRA.
Numenius phaeopus whimbrel	Bird	None	None	N/A	USFWS: BCC	Open habitats - tundra for nesting; mudflats, beaches, and saltmarshes the rest of the year.	Prefer feeding on invertebrates in intertidal zones but will eat insects or berries.	Low	No	Suitable habitat for this species does not exist within the SVRA or nearby adjacent agricultural fields. The SVRA is within the migration path for this species. There are no park or CNDDB records of this species in the vicinity of the SVRA.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Oreoscoptes montanus sage thrasher	Bird	None	None	N/A	IUCN: LC	Open, dry shrub-steppe habitats with a mix of dense ground cover and bare ground. During migration and winter, arid or semiarid open country with scattered bushes, grasslands, and open pinyon-juniper woodlands.	Tend to be more numerous in areas dominated by sagebrush, a small number of grasses, and some bare ground.	High	Yes	Suitable wintering habitat is present within the SVRA, less so on adjacent property. The park is in the non-breeding range. This species was last observed on 2/14/2017.
Pandion haliaetus osprey	Bird	None	None	N/A	CDF: S CDFW: WL IUCN: LC	Shallow, fish-filled water, including rivers, lakes, reservoirs, lagoons, swamps, and marshes.	N/A	Moderate	No	Marginal habitat for this species is minimally present adjacent to the SVRA in the Alamo Canal. The park is within the wintering range of this species, and it's been observed by park staff flying over the unit. This species was most recently observed on 10/3/2019.
Passerina amoena lazuli bunting	Bird	None	None	N/A	IUCN: LC	Brushy hillsides, areas near streams, wooded valleys, thickets and hedges along agricultural fields, and residential gardens from sea level to 9,500 feet elevation.	N/A	High	Yes	Suitable habitat for this species is present at the SVRA, and the park is within the migration path. This species was most recently observed on 4/21/2007.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Passerina caerulea blue grosbeak	Bird	None	None	N/A	IUCN: LC	Open woodlands, old fields, forest edges, transmission-line corridors, hedgerows, stream edges, deserts, mesquite savannas, saltcedar forests, and southern pine forests.	Small number of tree species, little canopy coverage, and low shrub diversity.	Moderate	No	Suitable habitat for this species is present at the SVRA, and the park is within the migration path. This species was listed in the 2001 Heber Dunes SVRA WHPP; however, an observation record for the park has not been found.
Phalacrocorax auritus double-crested cormorant	Bird	None	None	N/A	CDFW: WL IUCN: LC	Lakes and ponds. High perches for use after foraging.	N/A	Low	No	Suitable habitat for this species is not present within the SVRA or adjacent property as there is minimal aquatic habitat. The park is within the migratory path of this species and is close to year-round habitat. Staff regularly observe this species during flybys. The most recent observation was on 9/29/2020.
Phalaenoptilus nuttallii common poorwill	Bird	None	None	N/A	IUCN: LC	Shrubby, open areas in arid environments.	Roost on the ground or among rocks.	High	Yes	Suitable habitat for this species is present within the SVRA, and the unit is within the year-round range. Per Heber Dunes SVRA staff in 2021, a nesting pair has been observed in the day-use area for several years.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Phasianus colchicus ring-necked pheasant	Bird	None	None	N/A	IUCN: LC	Open fields and weedy roadsides with brushy cover. Agricultural lands. Widespread.	Fields interspersed with grass ditches, hedges, marshes, woodland borders, and brushy groves.	Low	No	Marginal suitable habitat for this species is present within the SVRA, and the species has the potential to be present year-round in surrounding agricultural fields. Adjacent lands provide higher quality habitats and are known to be utilized on occasion. In 2018, Heber Dunes staff observed a pheasant in neighboring agricultural fields.
Pheucticus melanocephalus black-headed grosbeak	Bird	None	None	N/A	IUCN: LC	Forests composed of large trees and rich understory.	Migrants seek out shrubs and trees rich in berries.	High	Yes	Suitable habitat for this species is present and the park is within the migration path. The most recent observation at the SVRA was on 4/21/2007.
Piranga ludoviciana western tanager	Bird	None	None	N/A	IUCN: LC	Forests. Favor open woods including wetlands, forest edges, and burns, as well as suburban parks and gardens.	Migrants frequent forests, woodland, scrub, partly open habitats, and human-made environments such as orchards, parks, gardens, and suburban edges.	High	Yes	Suitable habitat for this species is present within the SVRA. The park is within the migration path of this species. It was most recently observed on 4/17/2018.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Piranga rubra summer tanager	Bird	None	None	N/A	CDFW: SSC IUCNLC	Summer resident of desert riparian along lower Colorado River, and locally elsewhere in California deserts.	Requires cottonwood-willow riparian for nesting and foraging; prefers older, dense stands along streams.	Low	No	Marginal habitat for this species is present within the SVRA and along the nearby Alamo River. The SVRA is within the breeding range of the species. There no records of this species in the vicinity of the park.
Plegadis chihi white-faced ibis	Bird	None	None	N/A	CDFW: WL IUCN: LC	Nests in tall stands of cattail and emergent snags of tamarisk. Forages in flooded fields, marshes with shallow water, river edges, and irrigation canals with soil floors.	N/A	Moderate	No	Suitable habitat for this species is not present within the SVRA. Adjacent property may be suitable for foraging if flooded in the future. The SVRA is within the wintering range of this species and is near year-round habitat. This species is regularly observed flying over the park, most recently on 10/11/2018.
Polioptila caerulea blue-gray gnatcatcher	Bird	None	None	N/A	IUCN: LC	Broadleaf and mixed woodlands from chaparral to mature forests. In the southwest, oak and pinon-juniper woodlands, chaparral, and willow and cottonwood woodlands near water.	Moist areas, often near habitat edges preferred.	High	Yes	Suitable habitat for this species is present within the SVRA and the park is within the wintering range, close to the year-round range. This species is regularly observed during field surveys at the park, most recently on 9/29/2020.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Polioptila melanura black-tailed gnatcatcher	Bird	None	None	N/A	CDFW: WL IUCN: LC	Primarily inhabits wooded desert wash habitats; also occurs in desert scrub habitat, especially in winter.	Primarily inhabits wooded desert wash habitats; also occurs in desert scrub habitat, especially in winter.	High	Yes	Suitable habitat for this species is present within the SVRA and the park is within the year-round range. This species is regularly observed at the park. The most recent observation is 9/30/2020.
Pyrocephalus rubinus vermilion flycatcher	Bird	None	None	N/A	CDFW: SSC IUCN: LC	During nesting, inhabits desert riparian adjacent to irrigated fields, irrigation ditches, pastures, and other open, mesic areas.	Nest in cottonwood, willow, mesquite, and other large desert riparian trees.	Moderate	No	Suitable habitat for this species is present within the SVRA. There are no CNDDB or park records of this species in the vicinity of the SVRA. iNaturalist lists recent (2020-2021) records of this species in Mexicali, approximately 10.9 miles southwest of the SVRA.
Quiscalus mexicanus great-tailed grackle	Bird	None	None	N/A	IUCN: RWL	Natural habitats include chaparral and second growth forests but adapted to human-modified areas such as feedlots, farms, and fields.	N/A	Moderate	No	Marginal habitat for this species is present within the SVRA and on adjacent agricultural fields. The park is within the year-round range of this species. This species is regularly observed flying over the park and was most recently observed on 9/30/2020.
Rallus obsoletus yumanensis Yuma Ridgway's rail	Bird	Endangered	Threatened	N/A	CDFW: FP NABCI: RWL	Nests in freshwater marshes along the Colorado River and along the south and east ends of the Salton Sea.	Prefers stands of cattails and tules dissected by narrow channels of flowing water; principal food is crayfish.	Low	No	There is no suitable habitat for this species in or adjacent to the SVRA. A canal adjacent to the park does not have appropriate vegetation stands to support this species but may be used as a temporary stop. Per CNDDB, the nearest observation of this species is approximately 2.1 miles southeast of the SVRA. The park is within the migration path for this species.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Sayornis nigricans black phoebe	Bird	None	None	N/A	IUCN: LC	Open woodlands associated with water sources.	N/A	High	Yes	Suitable habitat for this species is present at the SVRA and it is regularly observed. The park is within the year-round range of this species. The most recent observation was on 10/1/2020.
Sayornis saya Say's phoebe	Bird	None	None	N/A	IUCN: LC	Dry, sparsely vegetated areas including sagebrush flats, badlands, dry barren foothills, canyons, and desert borders.	Wintering birds utilize open, grassy fields with scattered shrubs and agricultural areas.	High	Yes	Suitable habitat for this species is present at the SVRA and, in winter, adjacent property. The park is within the year-round range of this species and is regularly observed by staff. The most recent observation was on 10/1/2020.
Selasphorus rufus rufous hummingbird	Bird	None	None	N/A	USFWS: BCC	Breed in open or shrubby areas from sea level to 6,000 feet elevation. Winters in mountain meadows and woodlands.	Primarily feeds upon nectar from colorful, tubular flowers.	Moderate	No	Suitable habitat for this species is present within the SVRA, although adjacent habitat is not suitable. This species' preferred food source is not common in the area, which may limit populations. There are no CNDDB or park records of this species in the vicinity of the park. The nearest observation, from iNaturalist, is from 2019 outside El Centro, approximately 10.2 miles from the SVRA.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Setophaga coronata yellow-rumped warbler	Bird	None	None	N/A	IUCN: LC	Mature coniferous and mixed coniferous-deciduous woodlands. Winter in areas with fruiting shrubs or scattered trees such as parks, streamside woodlands, open pine and pine-oak forest, dunes, and residential areas.	N/A	High	Yes	Marginal habitat for this species is present within the SVRA and adjacent habitat. The park is within the wintering range (scarce) of this species. The most recent observation was on 10/10/2018.
Setophaga nigrescens black-throated gray warbler	Bird	None	None	N/A	IUCN: LC	Open pine forests, pine-oak woodlands, and pinyon-juniper forests with a brushy understory.	Migrants utilize similar habitats as well as woodlands, scrub, and thickets.	High	Yes	Suitable habitat for this species is present within the SVRA and adjacent habitat. The park is within the migration path for this species. The last observation was on 4/9/2020.
Setophaga petechia yellow warbler	Bird	None	None	N/A	CDFW: SSC USFWS: BCC	Riparian plant associations near water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada.	Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	High	Yes	Suitable habitat is present for this species in the SVRA, and the species has been observed at the park during avian surveys. District staff last observed this species on 9/30/2019 within the SVRA.
Spinus lawrencei Lawrence's goldfinch	Bird	None	None	N/A	USFWS: BCC	Arid, open woodlands, coastal scrub, streamside habitats, weedy fields, or deserts.	Breeding habitat is primarily woodlands with chaparral, weedy fields, and a source of freshwater.	Moderate	No	While this species has not been observed in the SVRA, potential habitat is present both within and adjacent to the park. This species is nomadic, seeking locations with preferred rainfall, seeding plants, and drinking water. When conditions are ideal, the SVRA or adjacent lands may be utilized.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Spizella breweri Brewer's sparrow	Bird	None	None	N/A	IUCN: LC USFWS: BCC	East of Cascade-Sierra Nevada crest, mountains and high valleys of Mojave Desert, and mountains at southern end of San Joaquin Valley.	For nesting they prefer high sagebrush plains, slopes and valley with Great Basin sagebrush and antelope brush.	High	Yes	Suitable wintering habitat is present within the SVRA and adjacent property. The park is within the winter range of this species and BRSP has been observed numerous times on-site. The most recent observation was on 10/1/2020.
Spizella passerina chipping sparrow	Bird	None	None	N/A	IUCN: LC	Open woodlands, grassy forests, woodlands and edges, parks and shrubby or tree-lined backyards.	Prefer evergreens.	Moderate	Yes	Marginal habitat for this species is present within and adjacent to the SVRA. The park is within the wintering range. CHSP has been observed once in the park on 4/10/2019.
Stelgidopteryx serripennis rough-winged swallow	Bird	None	None	N/A	IUCN: LC	Open areas often near water.	Salton Sea region: nest in earthen embankments, often irrigation ditches with near vertical walls	High	Yes	Suitable habitat for this species is present adjacent to the SVRA and the SVRA could provide foraging habitat. The park is within the year-round range of this species, near the breeding range. The most recent observation was on 2/14/2017.
Streptopelia decaocto Eurasian collared-dove	Bird	None	None	N/A	IUCN: LC	Broad. In agricultural areas, seek open sites with available grain.	May avoid areas with heavy forest cover or extremely cold temperatures.	High	Yes	Suitable habitat for this species is present within and near the SVRA. The park is in the year-round range. The most recent observation was on 9/29/2020.
Stumella neglecta Western meadowlark	Bird	None	None	N/A	IUCN: LC	Open grasslands, prairies, meadows, and some agricultural fields. Avoid wooded edges and areas with heavy shrubs.	N/A	High	Yes	Suitable habitat is not present within the SVRA, but adjacent agricultural fields are suitable. The park is within the year-round range of the species and observations occur regularly. The most recent observation was on 9/30/2020.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Sturnus vulgaris European starling	Bird	None	None	N/A	IUCN: LC	Broad. Open, grassy areas to forage, a water source, and trees or buildings with cavities or niches for nesting.	Avoid large, unbroken stretches of forest, chaparral, and desert.	Moderate	No	Suitable habitat is present within the SVRA, although adjacent agricultural fields may be more suitable for foraging. The park is within the year-round range of this species. A flyby was recorded on 9/29/2020.
Tachycineta bicolor tree swallow	Bird	None	None	N/A	IUCN: LC	Fields, marshes, shorelines, wooded swamps, and beaver ponds. Migrating and wintering birds may use open areas.	N/A	Moderate	No	Marginal habitat is present in and around the SVRA. The park is within the wintering range of this species. A flyover was observed on 4/16/2018.
Thryomanes bewickii Bewick's wren	Bird	None	None	N/A	IUCN: LC	Bushy areas, scrub and thickets in open country, or open woodland.	N/A	High	Yes	Suitable habitat is present within the SVRA and property east of the park. The SVRA is within the wintering range of this species. This species was last observed on 10/3/2019.
Toxostoma crissale Crissal thrasher	Bird	None	None	N/A	BLM: S CDFW: SSC USFS: S	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting.	Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Moderate	No	Suitable habitat is present within the SVRA and the park is within the species' range. CNDDB shows records of the species south of the Salton Sea, but not near the SVRA. The species has not been previously observed at the unit.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Toxostoma lecontei LeConte's thrasher	Bird	None	None	N/A	BLM: S CDFW: SSC IUCN: LC NABCI: RWL USFWS: BCC	Desert resident; primarily of open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats.	Commonly nests in a dense, spiny shrub or densely branched cactus in desert wash habitat, usually 2-8 feet above ground.	Low	No	Marginal habitat is present within the SVRA and property east of the park. There is no desert wash habitat on-site. The SVRA is within the year-round range of this species. This species was listed in the 2001 Heber Dunes SVRA WHPP, however an observation record for the park has not been found.
Tringa semipalmata willet	Bird	None	None	N/A	USFWS: BCC	During breeding season, occur near wetlands, marshes, and wet fields. During wintering, inhabit open beaches, bayshores, marshes, mudflats, and rocky coastal zones.	N/A	Low	No	Suitable habitat is not present for this species within the SVRA or adjacent property. The park is within the migration path for this species. There are no CNDDB or park records of this species in the vicinity of the park.
Turdus migratorius American robin	Bird	None	None	N/A	IUCN: LC	Broad. Fields, woodlands, forests, mountains up to treeline, recently burned forests, and tundra.	Winter in moist woods with berry-producing trees and shrubs.	High	Yes	Suitable habitat for this species is present in the SVRA and surrounding area. The SVRA is within the winter range for this species. This species was last observed 10/10/2018 by park staff.
Tyrannus verticalis Western kingbird	Bird	None	None	N/A	IUCN: LC	Open areas including grasslands, desert shrubs, savannah, pastures, cultivated fields, and urban lands.	N/A	High	Yes	Suitable habitat for this species is present within and adjacent to the SVRA. The park is in the migration path of this species, near the breeding range. The most recent observation was on 9/28/2020.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Tyto alba barn owl	Bird	None	None	N/A	IUCN: LC	Open habitats including grasslands, deserts, marshes, agricultural fields, strips of forest, woodlots, ranchlands, brushy fields, and cities.	Nest in tree cavities, caves, and in buildings.	Moderate	No	Suitable habitat for this species is present within and adjacent to the SVRA. The park is in the year-round range of this species. This species was listed in the 2001 Heber Dunes SVRA WHPP, however an observation record for the park has not been found.
Xanthocephalus xanthocephalus yellow-headed blackbird	Bird	None	None	N/A	CDFW: SSC IUCN: LC	Nests in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds.	Nests only where large insects such as Odonata are abundant, nesting timed with maximum emergence of aquatic insects.	High	Yes	Suitable habitat for this species is not present within or adjacent to the SVRA, although these areas may be suitable for foraging. The park is within the year-round range. The most recent observation was on 9/29/2020.
Zenaida asiatica white-winged dove	Bird	None	None	N/A	IUCN: LC	Dense, thorny forests, streamside woodlands, deserts, and urban areas.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and it is regularly observed. The park is within the breeding range of this species and is near the year-round range. The most recent observation was on 4/9/2020.
Zenaida macroura mourning dove	Bird	None	None	N/A	IUCN: LC	Open woodlands. Feeds in grasslands, agricultural fields, backyards, and roadsides.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and adjacent properties. The park is within the year-round range for this species and MODO are frequently observed perching in tamarisk trees. The most recent observation was on 10/1/2020.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Zonotrichia leucophrys white-crowned sparrow	Bird	None	None	N/A	IUCN: LC	Open or shrubby habitats, including tundra, high alpine meadows, and forest edges. During winter and migration, frequent thickets, weedy fields, agricultural fields, roadsides, and backyards.	Patches of bare ground and grasses.	High	Yes	Suitable habitat for this species is present within the SVRA and adjacent property. The SVRA is within the wintering range of this species. The most recent observation was on 9/30/2020.
Oncorhynchus tshawytscha pop. 11 chinook salmon - Central Valley spring-run ESU	Fish	Threatened	Endangered	N/A	AFS: TH	Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel. Water temps >27 C are lethal to adults.	Federal listing refers to populations spawning in Sacramento River and tributaries.	None	No	Suitable habitat for this species is not present at the SVRA or adjacent property. The SVRA is well outside of the known range of this species. There are no CNDDB or park records of this species in the vicinity of the park.
Oncorhynchus tshawytscha pop. 7 chinook salmon - Sacramento River winter-run ESU	Fish	Endangered	Threatened	N/A	AFS: EN	Sacramento River below Keswick Dam. Spawns in the Sacramento River, but not in tributary streams.	Requires clean, cold water over gravel beds with water temperatures between 6 and 14 C for spawning.	None	No	Suitable habitat for this species is not present at the SVRA or adjacent property. The SVRA is well outside of the known range of this species. There are no CNDDB or park records of this species in the vicinity of the park.
Podaxis pistillaris desert shaggymane	Fungus	None	None	N/A	N/A	Deserts and semi-deserts. Roadsides and disturbed areas.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA. This species was last observed by park staff on 12/8/2017.
Edrotes ventricosus fuzzy cannonball	Insect	None	None	N/A	N/A	Southwestern deserts.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA. Park staff last observed this species on 12/2/2017.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Eleodes armata armored stink beetle	Insect	None	None	N/A	N/A	Southwestern deserts.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA. Park staff last observed this species on 12/10/2017.
Erpetogomphus compositus white-belted ringtail	Insect	None	None	N/A	IUCN: LC	Depositional habitats with fine sediments, including sandy rivers and streams.	N/A	High	Yes	Marginal habitat for this species is present within the SVRA and adjacent canals. This species was last identified by park staff on 5/9/2017.
Stictiella villegasi Algodones sand wasp	Insect	None	None	N/A	N/A	Endemic to the Algodones Dunes in Imperial County. [Alternatively referred to as the Imperial Sand Dunes or the Glamis Dunes.]	N/A	Low	No	Little is known about the habitat requirements of this species, but it is currently considered endemic to the Algodones Dunes in Imperial County, SVRA. The SVRA is outside of the presumed range of this species. There are no CNDDB or park records of this species in the vicinity of the park.
Antrozous pallidus pallid bat	Mammal	None	None	N/A	BLM: S CDFW: SSC	Resident of southeastern deserts in desert riparian and desert wash habitats.	Nests in dense vegetation along streams/washes; mesquite, screwbean mesquite, ironwood, catclaw, acacia, arrow weed, willow.	Moderate	No	Suitable habitat is present for this species. Pallid bat have been observed in the general region, and there are no known limitations on their utilization of Heber Dunes SVRA. Per CNDDB, the nearest record is from Brawley, CA. Pallid bats have not been detected through auditory surveys; mist netting or roost surveys may be more effective for this species.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Canis latrans coyote	Mammal	None	None	N/A	IUCN: LC	Open country; broad. Sagebrush steppe, woodlands, prairies, deserts, oak savannahs, subalpine forests, alpine meadows, open ponderosa pine forests, and temperate rainforests.	Tolerant of human-modified areas.	High	Yes	Suitable habitat for this species is present within the SVRA and adjacent property. The park is within the range of this species, and it is regularly observed by park staff.
Chaetodipus formosus long-tailed pocket mouse	Mammal	None	None	N/A	IUCN: LC	Mixed sandy and rocky soils in relatively open arid areas.	Typical habitat contains small rocks that resemble it in size and color.	High	Yes	Suitable habitat for this species is present within the SVRA and adjacent property to the east. While rocky soils are not present, sandy soils are. This species is regularly observed during field surveys, most recently on 10/8/2020.
Chaetodipus penicillatus desert pocket mouse	Mammal	None	None	N/A	IUCN: LC	Sandy soils, sometimes on sand and small stones; open areas with scattered, low bushes.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and adjacent property to the east. This species is regularly observed during field surveys, most recently on 4/8/2021.
Chaetodipus spinatus spiny pocket mouse	Mammal	None	None	N/A	IUCN: LC	Rocky slopes and boulders with sparse vegetation. Sea level to 3,000 feet elevation.	N/A	High	Yes	Marginal habitat for this species is present within the SVRA. The park does not contain rocky habitat but is within the range for the species. This species has been observed during field surveys at the park. The most recent observation was on 4/16/2019.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Eptesicus fuscus big brown bat	Mammal	None	None	N/A	IUCN: LC	Forests, farms, cities, from arid lowlands to 9,000 feet elevation.	Roosts in hollow trees.	High	Yes	Suitable foraging habitat is present at the SVRA and adjacent properties. Marginal roosting habitat may be present within the SVRA. Auditory calls of this species were last observed in summer 2020.
Eumops perotis californicus western mastiff bat	Mammal	None	None	N/A	CDFW: SSC WBWG: HP	Many open, semi-arid to arid habitats, including conifer & deciduous woodlands, coastal scrub, grasslands, chaparral, etc.	Roosts in crevices in cliff faces, high buildings, trees and tunnels.	High	Yes	Suitable foraging and potential, marginal roosting habitat is present at the SVRA. Auditory observations of this species have been made during the summer at the SVRA, most recently in summer 2020.
Lasiurus blossevillii western red bat	Mammal	None	None	N/A	CDFW: SSC IUCN: LC WBWG: HP	Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests.	Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	High	Yes	Suitable habitat is present within the SVRA for this species, although adjacent properties may only support foraging. This species has been auditorily observed within the SVRA, last in summer 2020. Due to species' relative rarity in the region, additional verification of this species may be needed (Stokes, personal communication).
Lasiurus cinereus hoary bat	Mammal	None	None	N/A	IUCN: LC WBWG: MP	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding.	Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	High	Yes	Suitable habitat is present for this species within the SVRA and property to the east. This species was observed, through an acoustic detection, within the SVRA mostly recently in summer 2020.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Lasiurus xanthinus western yellow bat	Mammal	None	None	N/A	CDFW: SSC IUCN: LC WBWG: HP	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats.	Roosts in trees, particularly palms. Forages over water and among trees.	High	Yes	Suitable foraging and potential roosting habitat are present at the SVRA. Auditory observations of this species have been made during winter and summer monitoring at the SVRA, most recently in summer 2020.
Lepus californicus black-tailed jackrabbit	Mammal	None	None	N/A	IUCN: LC	Sagebrush flats, overgrazed pastures and rangelands, deserts, prairies, and agricultural land. Sea level to 12.500 feet elevation.	N/A	Moderate	No	Suitable habitat is present within and adjacent to the SVRA. This species was listed in the 2001 Heber Dunes SVRA WHPP, however an observation record for the park has not been found. Per current park staff, this species is not present.
Lynx rufus bobcat	Mammal	None	None	N/A	IUCN: LC	Highly variable: coniferous and deciduous forests, swamps, thickets, arid rocky areas, and mountains.	Prefers rocky outcrops and canyons.	High	Yes	Suitable habitat is present within the SVRA and adjacent properties. This species was last observed in 2018 at the SVRA.
Macrotus californicus California leaf-nosed bat	Mammal	None	None	N/A	BLM: S CDFW: SSC IUCN: LC WBWG: HP	Desert riparian, desert wash, desert scrub, desert succulent scrub, alkali scrub and palm oasis habitats.	Needs rocky, rugged terrain with mines or caves for roosting.	High	Yes	Suitable foraging habitat is present within and adjacent to the SVRA. Roosting habitat is not presumed present. An acoustic call of this species may have been detected in summer 2020 but additional work is needed to verify. Mist netting may be needed to verify call.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Mephitis mephitis striped skunk	Mammal	None	None	N/A	IUCN: LC	Brushy fields, farmland, open woods, deserts, and suburbs, usually not far from water.	N/A	Moderate	No	Suitable habitat is present both within and adjacent to the SVRA. In 2008, a specimen was observed deceased on a nearby road to the SVRA. Based on this observation, staff suspect this species may be present within the park, however no observations within the SVRA have been made.
Moytis yumanensis Yuma myotis	Mammal	None	None	N/A	BLM: S IUCN: LC WBWG: LMP	Optimal habitats are open forests and woodlands with sources of water over which to feed.	Distribution is closely tied to bodies of water. Maternity colonies in caves, mines, buildings, or crevices.	High	Yes	Suitable habitat is present within and adjacent to the SVRA. An acoustic recording of this species was detected in summer 2020.
Myotis californicus California myotis	Mammal	None	None	N/A	IUCN: LC	Desert scrub, riparian woodland, canyons, and forest. Lowlands to at least 8,000 feet elevation.	N/A	High	Yes	Suitable habitat is present within and adjacent to the SVRA. An acoustic recording of this species was detected in summer 2020.
Myotis occultus Arizona myotis	Mammal	None	None	N/A	CDFW: SSC IUCN: LC WBWG: MHP	Lowlands of the Colorado River and adjacent desert mountain ranges. Conifer forests.	Lowlands of the Colorado River and adjacent desert mountain ranges.	High	Yes	While much is still unknown about this species' habitat, the SVRA and adjacent lands provide suitable foraging habitat. A possible acoustic detection of this species was recorded in summer 2020 but additional work is needed to verify presence.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Neotoma albigula venusta Colorado Valley woodrat	Mammal	None	None	N/A	IUCN: LC	Low-lying desert areas in southeastern California. Closely associated with beaver-tail cactus & mesquite.	Intolerant of cold temps. Eats mainly succulent plants. Distribution influenced by abundance of nest building material	Low	No	Suitable habitat for this species is not present at the SVRA or adjacent lands. Preferred vegetation is not found on-site. The nearest CNDDB record is from 1909 and was observed within the El Centro quad, approximately 13.5 miles from the SVRA.
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	Mammal	None	None	N/A	CDFW: SSC	Forest habitats of moderate canopy & moderate to dense understory. May prefer chaparral & redwood habitats.	Constructs nests of shredded grass, leaves & other material. May be limited by availability of nest-building materials.	None	No	Suitable habitat for this species is not present at the SVRA or adjacent property. The SVRA is well outside of the known range of this species. There are no CNDDB or park records of this species in the vicinity of the park.
Notiosorex crawfordi desert shrew	Mammal	None	None	N/A	IUCN: LC	Desert and desert scrub, dry woodland, pinon-juniper, and ponderosa pines.	N/A	High	Yes	Suitable habitat for species is present at the SVRA and adjacent property to the east. Staff observed this species during pitfall trapping and uploaded a picture on 3/9/2009.
Nyctinomops femorosaccus pocketed free-tailed bat	Mammal	None	None	N/A	CDFW: SSC IUCN: LC WBWG: MHP	Variety of arid areas in Southern California; pine-juniper woodlands, desert scrub, palm oasis, desert wash, desert riparian, etc.	Rocky areas with high cliffs.	High	Yes	Suitable foraging habitat is present at the SVRA; roosting habitat is not present. Auditory observations of this species have been made during winter and summer monitoring at the SVRA, most recently in summer 2020.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Nyctinomops macrotis big free-tailed bat	Mammal	None	None	N/A	CDFW: SSC IUCN: LC WBWG: MHP	Low-lying arid areas in Southern California.	Need high cliffs or rocky outcrops for roosting sites. Feeds principally on large moths.	High	Yes	Suitable foraging habitat is present at the SVRA; roosting habitat is not present. Auditory observations of this species have been made during winter and summer monitoring at the SVRA, most recently in summer 2020.
Onychomys torridus Southern grasshopper mouse	Mammal	None	None	N/A	IUCN: LC	Low desert with scattered shrubs such as creosote bush and mesquite.	N/A	Moderate	No	Suitable habitat is present within the SVRA, although adjacent agricultural lands likely provide minimal habitat. This species has not been detected at the SVRA and there are no regional records of its presence.
Parastrellus hesperus canyon bat	Mammal	None	None	N/A	IUCN: LC	Desert scrub, arid grassland, canyons, and woodland, always close to water.	N/A	High	Yes	Suitable habitat is present within the SVRA and adjacent properties. An acoustic detection of this species was recorded in summer 2020.
Perognathus longimembris little pocket mouse	Mammal	None	None	N/A	IUCN: LC	Desert scrub, on sandy or gravelly soils with sparse vegetation. Also found in dry grassland and coastal sage.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and adjacent property to the east. This species was observed on 4/19/2018.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Peromyscus crinitus canyon mouse	Mammal	None	None	N/A	IUCN: LC	Desolate rocky terrain with very sparse vegetation, on canyon walls, mesas, and talus slopes.	N/A	Moderate	No	Suitable habitat for this species is not present within the SVRA or adjacent properties. Park records show this species was observed on 10/6/2020 but it is probable that the species was misidentified. *P. eremicus* is similar in appearance and known to occur at the SVRA. The park is within the range of PECR.
Peromyscus eremicus cactus mouse	Mammal	None	None	N/A	IUCN: LC	Deserts, usually on rocky soil with sparse vegetation, but also occurs on sandy flats and in desert grassland and chaparral.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and on property to the east. This species was most recently observed on 4/8/2021.
Peromyscus maniculatus deer mouse	Mammal	None	None	N/A	IUCN: LC	Broad. Boreal forest, tundra, desert, prairies, swamps, and high mountains.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and adjacent property. This species was most recently observed on 4/8/2021.
Procyon lotor raccoon	Mammal	None	None	N/A	IUCN: LC	Varied. Most common in wetlands, damp woods, and suburban areas.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and the park is within the known range. Staff took a picture of tracks on 12/7/2006. No observations have been made since.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Sigmodon hispidus eremicus Yuma hispid cotton rat	Mammal	None	None	N/A	CDFW: SSC	Along the Colorado River and in grass and agricultural areas near irrigation waters.	Wetlands and uplands with dense grass and herbaceous plants. Makes runways through vegetation. Nests on surface and in burrows.	Moderate	No	Suitable habitat is present in the eastern portion of the SVRA next to the canal as denser thickets of vegetation are present. Per CNDDB records, this species has been recorded in the Holtville East quad, approximately 8.4 miles from the park. This species has never been recorded at the park unit.
Spilogale gracilis spotted skunk	Mammal	None	None	N/A	IUCN: LC	Open woods, canyons, and farmland.	N/A	High	Yes	Marginal habitat for this species is present within the SVRA and adjacent properties. Eric Hollenbeck, a past Environmental Scientist, trapped a spotted skunk in the park in or before 2008. The 2011 General Plan, states that a spotted skunk had been observed in saltbush scrub at the SVRA.
Sylvilagus audubonii desert cottontail	Mammal	None	None	N/A	IUCN: LC	Varied, mainly in dry lowlands including deserts, grasslands, riparian brush, and pinon-juniper woodlands.	N/A	High	Yes	Suitable habitat is present within the SVRA and adjacent land. Park staff regularly observe this species at the SVRA.
Tadarida brasiliensis Mexican free-tailed bat	Mammal	None	None	N/A	IUCN: LC	Scrub, desert, rural areas, and towns. Not found in forested areas.	N/A	High	Yes	Suitable habitat is present within the SVRA and on adjacent property. An acoustic recording of this species was most recently observed in summer 2020.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Taxidea taxus American badger	Mammal	None	None	N/A	CDFW: SSC IUCN: LC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Needs sufficient food, friable soils, and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Moderate	No	Suitable habitat for this species is present within the SVRA. As the site is surrounded by agricultural fields, badgers may have limited movement throughout the area, but the SVRA is within the known range. Per CNDDB, there are two historic records of badger near Heber Dunes SVRA - one approximately 6 miles southwest of El Centro and another from Calexico.
Thomomys bottae Botta's pocket gopher	Mammal	None	None	N/A	IUCN: LC	Found in a wide range of soil types and vegetation zones, from below sea level to above timberline.	N/A	High	Yes	Suitable habitat for this species is present within and adjacent to the SVRA. Past staff observed this species during pitfall trapping and uploaded a picture on 3/9/2009.
Vulpes macrotis kit fox	Mammal	None	None	N/A	IUCN: LC	Arid open areas, shrub grassland, and desert.	N/A	Moderate	No	Suitable habitat for this species is present within and adjacent to the SVRA. This species has not been detected within the SVRA and there are no local regional records.
Xerospermophilus tereticaudus round-tailed ground squirrel	Mammal	None	None	N/A	IUCN: LC	Deserts; in canyons, dry plains, and river valleys. Low desert to about 4,250 feet elevation.	N/A	High	Yes	Suitable habitat for this species is present within and adjacent to the SVRA. Park staff observed this species in 2020.
Abronia villosa hairy sand verbena	Plant	None	None	N/A	N/A	Sandy places.	N/A	High	Yes	Suitable habitat for this species is present within and adjacent to the SVRA. This species was last recorded on 12/10/2017 within the SVRA.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Abronia villosa var. aurita chaparral sand-verbena	Plant	None	None	1B.1	BLM: S USFS: S	Chaparral, coastal scrub, desert dunes.	Sandy areas. -60-1570 m.	Moderate	No	Suitable habitat for this species is present within the SVRA, although agricultural fields surrounding the park are not suitable and may hinder recruitment. CNDDB lists one record for this species from 1912 in Calexico, approximately 5.2 miles southeast of the SVRA. The park is within Calscape's Estimated Plant Range. This species is not listed in park records.
Achyronychia cooperi onyx flower	Plant	None	None	N/A	N/A	Sandy slopes, flats, washes.	N/A	Moderate	No	Suitable habitat is present within the SVRA, and the park is within Calscape's Estimated Plant Range. The nearest observation of this species on Calflora is from 1949, approximately 5.5 miles southeast of the SVRA.
Amaranthus palmeri Palmer's amaranth	Plant	None	None	N/A	N/A	Disturbed areas, agricultural fields.	N/A	Moderate	No	Suitable habitat is present adjacent to the SVRA. This species was observed 2.9 miles north of the SVRA in 2020, per Calflora. An *Amaranthus* spp. was identified on 12/2/2017 by park staff.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Amaranthus watsonii Watson's amaranth	Plant	None	None	4.3	N/A	Mojavean desert scrub, Sonoran Desert scrub	Tolerant of disturbed areas.	Moderate	No	Suitable habitat for this species is present within the SVRA, although the agricultural fields surrounding the park are not suitable and may hinder recruitment. The closest historic record, from 1903, on CNPS is approximately 5.5 miles southeast of the park near Calexico. The park is within Calscape's Estimated Plant Range. This species is not listed in park records, but an *Amaranthus* spp. was identified on 12/2/2017 by park staff.
Ambrosia dumosa white bursage	Plant	None	None	N/A	N/A	Creosote bush scrub.	N/A	Moderate	No	Suitable habitat for this species is present at the SVRA and AMDU is associated with both creosote scrub and dune habitats. The 2011 General Plan indicates this species is absent from the SVRA. The park is within Calscape's Estimated Plant Range.
Ammannia coccinea valley redstem	Plant	None	None	N/A	N/A	Wet places, drying ponds, lake, creek margins.	N/A	Low	No	Suitable habitat for this species is not present at the SVRA, although adjacent property may be suitable. There are no local or park observations of this species. The park is within Calscape's Estimated Plant Range.
Aristida adscensionis sixweeks three-awn	Plant	None	None	N/A	N/A	Disturbed areas; dry, open places; rocky sites; shrubland.	N/A	Moderate	No	Suitable habitat for this species is present at the SVRA and the park is within Calscape's Estimated Plant Range. There are no local or park records of this species.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Astragalus aridus annual desert milkvetch	Plant	None	None	N/A	N/A	Sandy places.	N/A	Moderate	No	Suitable habitat for this species is present in the SVRA and the park is within Calscape's Estimated Plant Range. There are no park records of this species, but Calflora indicates a 1938 observation approximately 3.8 miles southeast of the SVRA.
Astragalus crotalariae Salton milkvetch	Plant	None	None	N/A	N/A	Valleys, washes, in desert foothills or open, sandy, gravelly areas.	N/A	Moderate	No	Suitable habitat for this species is present in the SVRA and the park is within Calscape's Estimated Plant Range. There are no park records of this species, but Calflora indicates a 1902 observation approximately 5.5 miles southwest of the SVRA.
Astragalus sabulonum gravel milk-vetch	Plant	None	None	2B.2	N/A	Desert dunes, Mojavean desert scrub, Sonoran Desert scrub.	Sandy or gravelly flats, washes, and roadsides. -60-885 m.	Moderate	No	Suitable habitat for this species is present within the SVRA. Nearby agricultural fields may limit recruitment. CNPS lists one historic record, from 1902, approximately 5.5 miles southeast of the park near Calexico. The park is within Calscape's Estimated Plant Range. The park does not have a record of this species' presence.
Atriplex canescens fourwing saltbush	Plant	None	None	N/A	N/A	Sites with poor soils, often salty, alkaline or clay slopes, stabilized sand dunes, gravelly washes.	N/A	High	Yes	The SVRA contains suitable habitat for this species, is within the known range, and this species is regularly observed on-site. The park is within Calscape's Estimated Plant Range.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Atriplex elegans wheelscale saltbush	Plant	None	None	N/A	N/A	Saline or alkaline soils, such as alkali flats and desert dry lakebeds.	N/A	High	Yes	The SVRA contains suitable habitat for this species, is within the known range, and this species has been observed on-site. The park is within Calscape's Estimated Plant Range.
Atriplex hymenelytra desert holly	Plant	None	None	N/A	N/A	Alkaline locations such as desert dry wash and creosote scrub in the Mojave and Sonoran deserts.	N/A	Low	No	Suitable habitat for this species is present within the SVRA and adjacent property to the east. The park is outside Calscape's Estimated Plant Range by several miles.
Atriplex lentiformis quailbush	Plant	None	None	N/A	N/A	Alkaline or saline washes, dry lakes, alkali sinks, and shadscale scrub; sometimes found in grasslands or coastal sage scrub.	N/A	High	Yes	The SVRA contains suitable habitat for this species, is within the known range, and this species has been observed on-site. The park is within Calscape's Estimated Plant Range.
Atriplex polycarpa saltbush	Plant	None	None	N/A	N/A	Alkaline flats, dry lakes.	N/A	High	Yes	The SVRA contains suitable habitat for this species, is within the known range, and this species has been observed on-site. The park is within Calscape's Estimated Plant Range.
Baccharis salicina willow baccharis	Plant	None	None	N/A	N/A	Sandy edges of rivers and washes, salt marshes, alkaline flats.	N/A	High	Yes	Suitable habitat for this species is present on-site and the SVRA is within Calscape's Estimated Plant Range. Per Calflora, this species was observed approximately 3.3 miles southeast of the SVRA in 1970. This species was listed in the 2011 General Plan.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Baccharis sarothroides broom baccharis	Plant	None	None	N/A	N/A	Gravelly, sandy washes, roadsides.	N/A	High	Yes	Marginal habitat is present on-site, particularly along the perimeter road. Staff last observed this species on 12/9/2017.
Baileya pauciradiata laxflower	Plant	None	None	N/A	N/A	Sandy desert soils, especially dunes.	N/A	Moderate	No	Suitable habitat is present on-site, and the park is within Calscape's Estimated Plant Range. This species has not been observed in the SVRA, but Calflora lists a 1912 observation 1.3 miles southeast of the park.
Baileya pleniradiata wooly marigold	Plant	None	None	N/A	N/A	Desert roadsides, sandy soils.	N/A	Moderate	No	Suitable habitat is present within the SVRA, and the park is within Calscape's Estimated Plant Range. The nearest observation of this species on Calflora is from 1932, approximately 7 miles northeast of the SVRA.
Bolboschoenus maritimus alkali bulrush	Plant	None	None	N/A	N/A	In dense stands locally. Fresh to brackish marshes, shores, wildlife refuges, rice-fields.	N/A	Low	No	Suitable habitat is not present within the SVRA, but the park is within Calscape's Estimated Plant Range. There are no local or park records.
Bouteloua barbata six-weeks grama	Plant	None	None	N/A	N/A	Generally open, sandy to rocky slopes, flats, washes, roadsides, disturbed sites, scrub, woodland, pine forest.	N/A	Moderate	No	Suitable habitat is present within the SVRA, and the park is within Calscape's Estimated Plant Range. There are no park records of this species; Calflora lists several records near Calexico, approximately 5.5 miles southwest of the SVRA.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Brassica nigra black mustard	Plant	None	None	N/A	N/A	Disturbed areas, fields.	N/A	High	Yes	This species is naturalized to the SVRA and has been observed on-site. Calflora shows records out of El Centro, approximately 10 miles northeast of the SVRA, from 1961. The 2011 General Plan associates this species with creosote scrub at the SVRA.
Caulanthus lasiophyllus California mustard	Plant	None	None	N/A	N/A	Desert flats, sandy banks, gravelly or rocky areas, talus slopes, shrubland, grassy fields, disturbed sites.	N/A	Moderate	No	Suitable habitat for this species is present on-site and the SVRA is within Calscape's Estimated Plant Range. There are no local or park records of this species.
Chilopsis linearis ssp. arcuata desert willow	Plant	None	None	N/A	N/A	Perennial desert streams, or sandy washes or canyons where there is likely to be subsurface water for most of the year.	In low desert, typically surrounded by creosote scrub. In high desert, Joshua tree woodland.	Low	No	Suitable habitat for this species is not present within the SVRA and the park is outside of Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no local records listed on Calflora.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Chloracantha spinosa spiny chloracantha	Plant	None	None	N/A	N/A	Seeps, moist streamsides, often saline or arid sites.	N/A	Moderate	No	Suitable habitat is not present within the SVRA, but adjacent property may be suitable. The park is within Calscape's Estimated Plant Range. There are no park records of this species; Calflora shows several observations near Calexico, approximately 5.5 miles southwest of the SVRA.
Chorizanthe corrugata wrinkled spineflower	Plant	None	None	N/A	N/A	Sand or gravel.	N/A	Moderate	No	Suitable habitat is present within the SVRA, and the park is within Calscape's Estimated Plant Range. There are no park records of this species; the nearest Calflora observation is out of Calexico in 1949, approximately 5.5 miles southwest of the SVRA.
Chorizanthe rigida devil's spineflower	Plant	None	None	N/A	N/A	Sand or gravel.	N/A	Moderate	No	Suitable habitat is present within the SVRA, and the park is within Calscape's Estimated Plant Range. There are no local or park records of this species.
Chylismia cardiophylla heartleaf suncup	Plant	None	None	N/A	N/A	Sandy and rocky desert scrub.	N/A	Moderate	No	Suitable habitat is present on-site, and the park is within Calscape's Estimated Plant Range. This species has not been observed in the SVRA, but Calflora lists a 1902 observation near Calexico, approximately 5.5 miles southwest of the SVRA.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Chylismia claviformis brown-eyed primrose	Plant	None	None	N/A	N/A	Broad.	N/A	Moderate	No	Suitable habitat is present on-site, and the park is within Calscape's Estimated Plant Range. There are no park or local records.
Cistanthe ambigua desert cistanthe	Plant	None	None	N/A	N/A	Desert scrub, sandy to silty soil, often alkaline.	N/A	Moderate	No	Suitable habitat is present on-site, and the park is within Calscape's Estimated Plant Range. There are no park or local records.
Condea emoryi desert-lavender	Plant	None	None	N/A	N/A	Gravelly, sandy washes, canyon bottoms, and alluvial fans. Typically associated with creosote scrub.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA and adjacent property to the east. The park is within Calscape's Estimated Plant Range. There are no local records of this species listed on Calflora.
Cryptantha angustifolia narrow-leaved cryptantha	Plant	None	None	N/A	N/A	Desert scrub and woodland.	N/A	High	Yes	The SVRA contains suitable habitat for this species and the park is within the known range. Calflora records show an observation near Calexico, approximately 5.5 miles southeast of the SVRA. *Cryptantha* species have been observed on-site before, however, the species was not distinguished. Narrow-leafed cryptantha is easier to distinguish from other *Cryptantha* species, and it is regionally common. This species is presumed to be present when annual conditions are suitable.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Cryptantha costata [alt. *Johnstonella costata*] ribbed cryptantha	Plant	None	None	4.3	N/A	Sonoran desert scrub, Mojavean desert scrub, desert dunes.	Sandy and gravelly places. -60-500 m.	High	Yes	The SVRA contains suitable habitat for this species and the park is within the known range. Cryptantha species have been observed on-site before, however, it is challenging to distinguish species in the field. The park is within Calscape's Estimated Plant Range. This species is presumed to be present when annual conditions are suitable.
Cryptantha holoptera [alt. *Johnstonella holoptera*] winged cryptantha	Plant	None	None	4.3	N/A	Mojavean desert scrub, Sonoran desert scrub.	Gravelly to rocky soils in washes, on slopes and ridges. 100-1690 m.	Low	No	Suitable habitat for this species is not present within the SVRA or adjacent property. The park is within Calscape's Estimated Plant Range and the nearest observation, per Calflora, is approximately 5.5 miles southwest of the SVRA from 1902. The SVRA is composed of sandy soils, while surrounding land has been converted to agriculture. There are no CNDDB or park records of this species in the vicinity of the unit, however *Cryptantha* species are difficult to distinguish. This species is not presumed present due to habitat type, but it has a low potential to occur.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Cryptantha micrantha redroot cryptantha	Plant	None	None	N/A	N/A	Sonoran and Mojave Desert.	N/A	High	Yes	The SVRA contains suitable habitat for this species and the park is within the known range. Calflora lists a 1966 record of this species approximately 6 miles northeast of the SVRA. *Cryptantha* species have been observed on-site before, however, it is challenging to distinguish individual species. This species is presumed to be present when annual conditions are suitable.
Cucurbita palmata coyote melon	Plant	None	None	N/A	N/A	Sandy places.	N/A	Moderate	No	Suitable habitat is present on-site, and the park is within Calscape's Estimated Plant Range. There are no park records of this species. The nearest observation on Calflora is from 1902 near Calexico, approximately 6 miles southwest of the SVRA.
Cylindropuntia bigelovii teddy-bear cholla	Plant	None	None	N/A	N/A	Rocky fans, benches, with creosote bush.	N/A	Low	No	The SVRA does not contain suitable habitat for this species. The park is outside of Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no park or local records of this species.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Cylindropuntia ganderi Gander's cholla	Plant	None	None	N/A	N/A	Desert, chaparral, pinyon/juniper woodland, sandy flats, rocky hillsides, and boulder fields.	N/A	Low	No	The SVRA does not contain suitable habitat for this species. The park is outside of Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are local records of this species in the SVRA.
Cyperus erythrorhizos red rooted cyperus	Plant	None	None	N/A	N/A	Ditches, riverbanks, shores.	N/A	Low	No	The SVRA does not contain suitable habitat for this species, but the park is within Calscape's Estimated Plant Range. There are no park records of this species; Calflora lists several observations out of Calexico, approximately 5.5 miles southwest of the SVRA.
Cyperus esculentus chufa sedge	Plant	None	None	N/A	N/A	Wet soils, irrigated fields and yards, golf courses.	N/A	Low	No	The SVRA does not contain suitable habitat for this species, but adjacent property may. The park is within Calscape's Estimated Plant Range. There are no local or park records of this species.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Cyperus odoratus fragrant flatsedge	Plant	None	None	N/A	N/A	Wet, disturbed soils	N/A	Low	No	The SVRA does not contain suitable habitat for this species, but adjacent property may. The park is within Calscape's Estimated Plant Range. There are no park records of this species; Calflora lists several observations near Holtville, approximately 5.5 miles north of the SVRA.
Dalea mollis silky dalea	Plant	None	None	N/A	N/A	Creosote bush flats, washes, and roadsides.	N/A	Moderate	No	Suitable habitat is present on-site, and the park is within Calscape's Estimated Plant Range. There are no park records of this species; the nearest Calflora record is from 1920, approximately 7 miles northeast of the SVRA.
Dalea mollissima silky dalea	Plant	None	None	N/A	N/A	Desert flats, washes.	N/A	Moderate	No	Suitable habitat is present on-site, and the park is within Calscape's Estimated Plant Range. There are no park records of this species; the nearest Calflora record is from Calexico in 1902, approximately 5.5 miles southwest of the SVRA.
Dicoria canescens desert twinbugs	Plant	None	None	N/A	N/A	Alkaline or sandy soils, dunes, washes, flats.	N/A	Moderate	No	Suitable habitat is present on-site, and the park is within Calscape's Estimated Plant Range. There are no park records of this species; Calflora lists a 1938 record approximately 1.7 miles south of the SVRA.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Dithyrea californica spectacle pod	Plant	None	None	N/A	N/A	Abundant in sandy places, washes, scrub.	N/A	Moderate	No	Suitable habitat is present on-site, and the park is within Calscape's Estimated Plant Range. There are no local or park records of this species.
Eclipta prostrata false daisy	Plant	None	None	N/A	N/A	Damp places.	N/A	Low	No	Suitable habitat is not present within the SVRA, although adjacent property may be suitable. The park is within Calscape's Estimated Plant Range. There are no park records of this species and the nearest record on Calflora is out of El Centro, approximately 10.5 miles northwest of the park.
Encelia farinosa brittlebush	Plant	None	None	N/A	N/A	Colorado and Mojave Deserts. Arid slopes, canyons, washes, and alluvial fans in fast draining sandy, gravelly soil, often among boulders but also in pure sand.	N/A	Low	No	Suitable habitat for this species is present on-site. The SVRA is outside of Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no local records of this species.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Encelia frutescens button brittlebush	Plant	None	None	N/A	N/A	Southwestern deserts, especially the Mojave Desert.	N/A	Low	No	Suitable habitat for this species is present on-site. The SVRA is outside of Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no local records of this species.
Ephedra californica desert tea	Plant	None	None	N/A	N/A	Scattered in arid grassland, chaparral, creosote scrub.	N/A	Moderate	No	Suitable habitat for this species is present on-site and the park is within Calscape's Estimated Plant Range. There are no local or park observations of this species.
Ephedra trifurca longleaf ephedra	Plant	None	None	N/A	N/A	Creosote scrub, sandy washes, flats, stabilized sand dunes	N/A	Moderate	No	Suitable habitat for this species is present on-site and the park is within Calscape's Estimated Plant Range. There are no park observations of this species; the nearest Calflora record is from 1929 in Holtville, approximately 5.5 miles north of the SVRA.
Eragrostis pectinacea tufted lovegrass	Plant	None	None	N/A	N/A	Varied. Open spaces, including disturbed areas and roadsides.	N/A	Moderate	No	Suitable habitat for this species is present on-site and the park is within Calscape's Estimated Plant Range. There are no local or park observations of this species.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Eremothera boothii Booth's evening primrose	Plant	None	None	N/A	N/A	Deserts.	N/A	Moderate	No	Suitable habitat for this species is present on-site and the park is within Calscape's Estimated Plant Range. There are no local or park observations of this species.
Eriogonum deflexum flatcrown buckwheat	Plant	None	None	N/A	N/A	Desert scrub.	N/A	Moderate	No	Suitable habitat for this species is present on-site and the park is within Calscape's Estimated Plant Range. There are no local or park observations of this species.
Eriogonum deserticola Colorado Desert wild buckwheat	Plant	None	None	N/A	N/A	Desert sand dunes.	N/A	Moderate	No	Suitable habitat for this species is present on-site and the park is within Calscape's Estimated Plant Range. There are no park records of this species. The nearest Calflora record is from 1925, approximately 2.2 miles southeast of the SVRA.
Eriogonum thomasii Thomas' wild buckwheat	Plant	None	None	N/A	N/A	Desert sands. Broad.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA and the park is within Calscape's Estimated Plant Range. There are no local or park records of this species.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Eriogonum trichopes little desert trumpet	Plant	None	None	N/A	N/A	Desert sand or gravel.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA and the park is within Calscape's Estimated Plant Range. There are no park records of this species and limited local records. The nearest Calflora record is from 1928, approximately 3.2 miles north of the SVRA.
Euphorbia abramsiana Abrams' spurge	Plant	None	None	2B.2	N/A	Mojavean desert scrub, Sonoran desert scrub.	Sandy sites. -45-1445 m.	Moderate	No	Suitable habitat for this species is present within SVRA although adjacent agricultural lands are not suitable. CNDDB shows historic records (1912) approximately 0.35 miles from the SVRA entrance. The park is within Calscape's Estimated Plant Range. There is no record of this species within the SVRA boundary.
Euphorbia polycarpa smallseed sandmat	Plant	None	None	N/A	N/A	Deserts and other dry, sandy areas.	N/A	Low	No	The SVRA contains suitable habitat for this species, but the park is outside of Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no local records.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Ferocactus cylindraceus barrel cactus	Plant	None	None	N/A	N/A	Gravelly, rocky, or sandy places.	N/A	Low	No	Suitable habitat for this species is present within the SVRA and adjacent property, although rainfall is likely inadequate to support this species. The park is outside of Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no local records of this species.
Fouquieria splendens ocotillo	Plant	None	None	N/A	N/A	Arid slopes, canyons, washes, and alluvial fans in fast draining sandy, gravelly soil, often among boulders but also in pure sand.	N/A	Low	No	Suitable habitat for this species is present within the SVRA and adjacent property, although rainfall is likely inadequate to support this species. The park is outside of Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no local records of this species.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Geraea canescens hairy desert sunflower	Plant	None	None	N/A	N/A	Sandy desert soils.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA and the park is within Calscape's Estimated Plant Range. There are no park records of this species. The nearest local observation, per Calflora, is from 2013 near Calexico, approximately 5.5 miles southwest of the SVRA.
Helianthus annuus common sunflower	Plant	None	None	N/A	N/A	Disturbed areas such as road shoulders, edges of farm fields, and vacant lots.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA and adjacent property. The park is within Calscape's Estimated Plant Range. There are no local records of this species on Calflora.
Heliotropium curassavicum seaside heliotrope	Plant	None	None	N/A	N/A	Moist to dry, saline to alkaline soils, generally near water.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and adjacent property. The park is within Calscape's Estimated Plant Range. SVRA staff last observed this species on 11/17/2017.
Hesperocallis undulata desert lily	Plant	None	None	N/A	N/A	Sandy flats.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA and adjacent property. The park is within Calscape's Estimated Plant Range. There are no local records of this species listed on Calflora.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Hilaria rigida big galleta grass	Plant	None	None	N/A	N/A	Dry, open places; sandy, rocky places.	N/A	Low	No	Suitable habitat for this species is present within the SVRA and adjacent property. The park is within Calscape's Estimated Plant Range. There are no local records of this species listed on Calflora.
Hoffmannseggia glauca pig-nut	Plant	None	None	N/A	N/A	Dry, alkaline flats in deserts, disturbed areas.	N/A	Moderate	No	Suitable habitat for this species is on-site and the park is within Calscape's Estimated Plant Range. There are no park records of this species. Per Calflora, the nearest observation is from 1961 outside Heber, approximately 6 miles west of the SVRA.
Hymenoclea salsola cheesebush	Plant	None	None	N/A	N/A	Deserts. Sandy soils, alkaline environments, and disturbed sites.	N/A	Low	No	Suitable habitat for this species is present within the SVRA and adjacent property, although rainfall is likely not adequate to support this species. The park is outside Calscape's Estimated Plant Range. The park is outside of Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no local records of this species listed on Calflora.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Imperata brevifolia California satintail	Plant	None	None	2B.1	USFS: S	Coastal scrub, chaparral, riparian scrub, mojavean desert scrub, meadows, and seeps (alkali), riparian scrub.	Mesic sites, alkali seeps, riparian areas. 3-1495 m.	Low	No	Suitable habitat for this species is not present within the SVRA, although adjacent canals may provide marginal habitat. CNDDB returned one record of this species from 1963 near the Wistaria Canal approximately 10.8 miles from the SVRA. The park is far outside of Calscape's Estimated Plant Range. There is no record of this species within the SVRA boundary.
Isocoma acradenia alkali goldenbush	Plant	None	None	N/A	N/A	Arid, sandy areas, particularly mineral-rich area such as alkali flats and gypsum soils.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA and adjacent property. The park is within Calscape's Estimated Plant Range. Calflora lists a 2018 record of this species approximately 8 miles northwest of the SVRA.
Kallstroemia californica California caltrop	Plant	None	None	N/A	N/A	Flat, sandy, or disturbed areas.	N/A	High	No	Suitable habitat for this species is present within the SVRA and the park is within Calscape's Estimated Plant Range. The nearest Calflora record is from 1902 near Calexico, approximately 5.5 miles southwest of the SVRA. This species was potentially identified within the SVRA on 11/26/2017 per iNaturalist.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Krameria bicolor [alt. *Krameria grayi*] white rhatany	Plant	None	None	N/A	N/A	Deserts. Dry, rocky, or sandy places, especially on lime soils.	N/A	Low	No	Suitable habitat for this species is present within the SVRA and adjacent property. The park is outside of Calscape's Estimated Plant Range. The park is outside of Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no local records listed in Calflora.
Laennecia coulteri Coulter's horseweed	Plant	None	None	N/A	N/A	Disturbed sites, clayey or sandy soils, often seasonally wet, alkaline.	N/A	Moderate	No	Suitable habitat is present on-site, and the park is within Calscape's Estimated Plant Range. There are no park observations of this species. Per Calflora, the nearest observation is from 1904 near Calexico, approximately 5.5 miles southwest of the SVRA.
Larrea tridentata creosote	Plant	None	None	N/A	N/A	Mountains, valleys, and washes in deserts.	N/A	High	Yes	Suitable habitat for this species is present in the SVRA and adjacent property to the east. The park is within Calscape's Estimated Plant Range. This species is dominant in the Native Vegetation MU. Known to occur on-site.
Lepidium lasiocarpum shaggyfruit pepperweed	Plant	None	None	N/A	N/A	Dry flats, washes, streambeds, roadsides, sagebrush scrub, pinyon/juniper woodland.	N/A	Moderate	No	Suitable habitat is present on-site, and the park is within Calscape's Estimated Plant Range. There are no park or local records.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Lepidium oblongum veiny pepperweed	Plant	None	None	N/A	N/A	Bluffs, slopes, disturbed areas, roadsides, flats, pastures.	N/A	Moderate	No	Suitable habitat is minimally present on-site, as well as on adjacent properties. The park is within Calscape's Estimated Plant Range. There are no park or local records.
Leptochloa fusca bearded sprangletop	Plant	None	None	N/A	N/A	Salty, wet conditions. Salt marshes and shallow depressions.	N/A	Low	No	Suitable habitat is not present on-site. Adjacent properties contain suitable habitat. The park is within Calscape's Estimated Plant Range. There are no park records of this species. Per Calflora, the nearest record of this species is from Holtville in 1912, approximately 5.1 miles north of the SVRA.
Lycium andersonii water jacket	Plant	None	None	N/A	N/A	Gravelly or rocky slopes, washes.	N/A	Low	No	Suitable habitat is not present on-site or adjacent property. The park is within Calscape's Estimated Plant Range. There are no park records of this species. Calflora lists a 1941 record in Calexico, approximately 6 miles southwest of the SVRA.
Lycium brevipes desert thorn	Plant	None	None	N/A	N/A	Desert or arid coastal bluffs, slopes, and washes.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA. The park is within Calscape's Estimated Plant Range. There are no local records listed in Calflora.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Malvella leprosa alkali mallow	Plant	None	None	N/A	N/A	Valleys, generally saline.	N/A	Low	No	Suitable habitat for this species is not present within the SVRA. The park is within Calscape's Estimated Plant Range. There are no local or park records of this species.
Mentzelia hirsutissima hairy stickleaf	Plant	None	None	2B.3	N/A	Sonoran desert scrub.	Washes, fans, slopes; coarse rubble and talus slopes; rocky sites. -5-720 m.	Low	No	Marginal habitat for this species is present within the SVRA and adjacent habitat is not suitable. Per CNDDB, the nearest record of this species was recorded in 1963 outside Mount Signal, approximately 13.3 miles from the SVRA. This observation stated the population was not abundant. The park is outside of Calscape's Estimated Plant Range.
Monoptilon bellioides Mojave desertstar	Plant	None	None	N/A	N/A	Sandy flats, washes.	N/A	Moderate	No	Suitable habitat for this species is present on-site and the park is within Calscape's Estimated Plant Range. There are no local or park observations of this species.
Oenothera deltoides dune primrose	Plant	None	None	N/A	N/A	Sandy habitats from desert to beach.	N/A	Moderate	No	Suitable habitat for this species is present on-site and the park is within Calscape's Estimated Plant Range. There are no park observations of this species; the nearest Calflora record is from 1949 in Calexico, approximately 6 miles from the SVRA.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Oligomeris linifolia lineleaf whitepuff	Plant	None	None	N/A	N/A	Deserts, plains, and coastline.	Tolerant of disturbed areas.	High	Yes	Suitable habitat for this species is present within the SVRA. The park is within Calscape's Estimated Plant Range. There are no local records listed in Calflora. The General Plan states this species is a common understory species in the creosote scrub at the SVRA.
Olneya tesota ironwood	Plant	None	None	N/A	N/A	Washes and hillside drainages in the Sonoran Desert.	N/A	Low	No	Suitable habitat for this species is not present on-site or in the vicinity of the park. The SVRA is outside of Calscape's Estimated Plant Range and there are no local records listed in Calflora.This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA.
Opuntia basilaris beavertail cactus	Plant	None	None	N/A	N/A	High and low desert, in sandy valley floors, alluvial fans, and rocky slopes and canyons	N/A	Low	No	Suitable habitat for this species is present within the SVRA but the park is outside Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no local records listed in Calflora.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Palafoxia arida Spanish needle	Plant	None	None	N/A	N/A	Desert.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and the park is within Calscape's Estimated Plant Range. The species was last observed by park staff on 12/9/2017.
Parkinsonia florida blue palo verde	Plant	None	None	N/A	N/A	Mesas, bajadas, canyons, washes, and flood plains of the Sonoran Desert.	N/A	Low	No	The SVRA does not contain suitable habitat for this species. The park is outside of Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no park or local records of this species in the SVRA.
Parkinsonia microphylla yellow palo verde	Plant	None	None	N/A	N/A	Desert slopes to around 3,000 feet elevation.	N/A	Moderate	No	The SVRA contains suitable habitat for this species and is within the known range. The park is within Calscape's Estimated Plant Range. There are no park records of this species within the SVRA. Calflora lists a 1963 observation of this species approximately 4.9 miles north of the SVRA.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Pectis papposa chinchweed	Plant	None	None	N/A	N/A	Arid plains, rocky slopes, in creosote scrub.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and the park is within Calscape's Estimated Plant Range. The nearest Calflora record is from 1912, approximately 1 mile directly south of the SVRA. Per iNaturalist this species was last observed by park staff on 11/17/2017.
Pectocarya heterocarpa mixed-nut pectocarya	Plant	None	None	N/A	N/A	Washes, roadsides, openings in creosote scrub, Joshua tree woodland.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA and the park is within Calscape's Estimated Plant Range. There are no park observations of this species. Per Calflora, the nearest record is from 1902 near Calexico, approximately 6 miles southwest of the SVRA.
Peucephyllum schotti desert fir-pygmy cedar	Plant	None	None	N/A	N/A	Rocky slopes, washes, creosote scrub.	N/A	Low	No	Suitable habitat for this species is present within the SVRA but the park is outside Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no local records listed in Calflora.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Pholisma sonorae sand food	Plant	None	None	1B.2	BLM: S USFS: S	Desert dunes, Sonoran desert scrub.	Loose, deep sand dunes, usually on the more stable, windward face. 0-125 m.	Moderate	No	Suitable habitat for this species is present within the SVRA, but adjacent agricultural lands are not suitable, likely hindering recruitment. Per CNDDB, the closest historic record is from 1915 along East Evan Hewes Highway, approximately 5.1 miles northeast of the SVRA. The park is within Calscape's Estimated Plant Range.
Phoradendron californicum desert mistletoe	Plant	None	None	N/A	N/A	Desert. Hemiparasitic to host plants, often leguminous woody desert trees such as *Cercidium* and *Prosopis*.	N/A	Moderate	No	Marginal habitat is present for this species within the SVRA, and the park is within Calscape's Estimated Plant Range. Preferred tree species are not on-site and much of the surrounding area has been converted to agriculture. There are no local records of this species on Calflora.
Phragmites australis common reed	Plant	None	None	N/A	N/A	Pond and lake margins, sloughs, marshes.	N/A	Low	No	Suitable habitat is not present within the SVRA; adjacent property may provide marginal habitat. There are no park or local records of this species. The park is within Calscape's Estimated Plant Range.
Physalis acutifolia sharp-leaf ground cherry	Plant	None	None	N/A	N/A	Disturbed places, roadsides.	N/A	Moderate	No	Suitable habitat is present within the SVRA. The park is within Calscape's Estimated Plant Range. There are no park records of this species. Per Calflora, the nearest observation is from 1924 outside Meloland, approximately 6 miles northwest of the SVRA.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Plantago ovata woolly plantain	Plant	None	None	N/A	N/A	Sandy or gravelly soils.	N/A	Moderate	No	Suitable habitat is present within the SVRA, and the park is within Calscape's Estimated Plant Range. There are no local or park records of this species.
Pluchea sericea arrow weed	Plant	None	None	N/A	N/A	Stream bottoms, washes, and wet places.	N/A	High	Yes	Suitable habitat for this species is present on-site and it is common in multiple portions of the SVRA. The park is within Calscape's Estimated Plant Range.
Populus fremontii Fremont cottonwood	Plant	None	None	N/A	N/A	Riparian or other wetland habitats such as alluvial bottom lands, streamsides, and seeps throughout the state.	In desert riparian areas, it occurs adjacent to creosote scrub or desert transition chaparral.	Low	No	Suitable habitat for this species is not present within the SVRA. The park is within Calscape's Estimated Plant Range but there are no local observations.
Prosopis glandulosa honey mesquite	Plant	None	None	N/A	N/A	Flats and washes in arid regions with underground water.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA and the park is within Calscape's Estimated Plant Range. There are no local records of this species listed on Calflora.
Prosopis pubescens screwbean mesquite	Plant	None	None	N/A	N/A	Creek, river bottoms, sandy or gravelly washes or ravines.	N/A	Low	No	Suitable habitat for this species is not present within the SVRA. The park is within Calscape's Estimated Plant Range. There are no park observations of this species; the nearest Calflora record is from 1903 near Calexico, approximately 6 miles from the SVRA.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Pseudognaphalium stramineum Chilean cudweed	Plant	None	None	N/A	N/A	Many habitats, dunes, chaparral slopes, roadsides.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA and the park is within Calscape's Estimated Plant Range. There are no local or park records of this species.
Psorothamnus emoryi dyebush	Plant	None	None	N/A	N/A	Desert flats, washes, dunes.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA and the park is within Calscape's Estimated Plant Range. The nearest Calflora observation is approximately 7 miles northeast of the SVRA from 2018.
Psorothamnus schottii indigo bush	Plant	None	None	N/A	N/A	Gravelly to sandy slopes, benches, washes.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA and the park is within Calscape's Estimated Plant Range. The nearest Calflora observation is approximately 10.5 miles northwest of the SVRA from 1906.
Psorothamnus spinosus smoke tree	Plant	None	None	N/A	N/A	Desert washes.	N/A	Low	No	Suitable habitat for this species is not present on-site and the park is outside of Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no local records of this species.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Salix exigua sandbar willow	Plant	None	None	N/A	N/A	Streamsides, marshes, pond margins, drainage ditches, and other wet areas.	N/A	Low	No	Suitable habitat is not present within the SVRA; marginal habitat may be present on adjacent properties. The park is within Calscape's Estimated Plant Range. There are no park records of this species. The nearest Calflora observation is from 1902 in Calexico, approximately 6 miles southwest of the SVRA.
Salix gooddingii Goodding's black willow	Plant	None	None	N/A	N/A	Streamsides, marshes, seepage places, washes, meadows.	N/A	Low	No	Suitable habitat for this species is not present on-site, but the park is within Calscape's Estimated Plant Range. There are no local records of this species. Listed in the 2011 General Plan.
Salsola tragus Russian thistle	Plant	None	None	N/A	N/A	Disturbed places.	N/A	High	Yes	Suitable habitat for this species is present on-site. This species was listed in the 2011 General Plan.
Schismus barbatus common Mediterranean grass	Plant	None	None	N/A	N/A	Dry, open, generally disturbed areas.	N/A	High	Yes	Suitable habitat for this species is present on-site. There are no local records. The 2011 General Plan associates this species with creosote scrub at the SVRA.
Sesuvium verrucosum Western sea-purslane	Plant	None	None	N/A	N/A	Moist or seasonally dry flats, margins of generally saline wetlands.	N/A	Low	No	Suitable habitat for this species is not present on-site but adjacent properties may contain marginal habitat. There are no park records of this species; the nearest Calflora observation is from 2010 near Date City, approximately 7 miles northeast of the SVRA.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Sphaeralcea ambigua apricot mallow	Plant	None	None	N/A	N/A	Desert and semi-desert areas, often with boulders.	N/A	Moderate	No	Suitable habitat for this species is present on-site and the park is within Calscape's Estimated Plant Range. There are no local observations listed in Calflora. The General Plan indicates this species is associated with saltbush scrub at Heber Dunes SVRA.
Sphaeralcea coulteri Coullter's globemallow	Plant	None	None	N/A	N/A	Desert. Dry, sandy places.	N/A	Moderate	No	Suitable habitat for this species is present on-site and the park is within Calscape's Estimated Plant Range. There are no confirmed records of this plant within the SVRA or any local records. However, Dr. Jon Rebman suggested that a *Sphaeraclea* sp. observed within the SVRA on 11/26/2017 may be this species.
Sphaeralcea emoryi Emory's globemallow	Plant	None	None	N/A	N/A	Desert scrub.	N/A	Moderate	No	Suitable habitat is present on-site, and the park is within Calscape's Estimated Plant Range. There are no park observations of this species and the nearest local observation, per Calflora, is from 1902 near Calexico, approximately 6 miles southwest of the SVRA.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Suaeda nigra bush seepweed	Plant	None	None	N/A	N/A	Saline/alkaline soils with subsurface moisture.	N/A	High	Yes	Suitable habitat for this species is present on-site and it is known to occur in areas of the SVRA. The nearest Calflora record is from 1937, approximately 0.5-mile northeast of the SVRA. The park is within Calscape's Estimated Plant Range. The General Plan states that this species is associated with the saltbush scrub at Heber Dunes SVRA.
Symphyotrichum subulatum annual saltmarsh aster	Plant	None	None	N/A	N/A	Naturalized in California deserts.	N/A	Moderate	No	Suitable habitat for this species is present on-site and the park is within Calscape's Estimated Plant Range. There are no park records of this species and the nearest Calflora record is from 1928 in El Centro, approximately 10 miles northwest of the SVRA.
Tamarix aphylla Athel tamarisk	Plant	None	None	N/A	N/A	Washes, roadsides.	N/A	High	Yes	Suitable habitat for this species is present on-site and it is known to occur in a large portion of the SVRA, except for the Native Vegetation MU. Based on the size of the tamarisk, it is probable that it is historic.
Tamarix ramosissima saltcedar	Plant	None	None	N/A	N/A	Washes, streambanks.	N/A	High	Yes	Marginal habitat for this species is present within the SVRA. This species is invasive and can easily spread in an area. Per the General Plan, this species is associated with the saltbush scrub habitat at Heber Dunes SVRA.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Tiquilia palmeri Palmer's tiquilia	Plant	None	None	N/A	N/A	Sandy gravel soils, on terraced flats.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and the park is within Calscape's Estimated Plant Range. The nearest Calflora record is from 1938, approximately 3.5 miles southeast of the SVRA. This species is an understory shrub in the creosote scrub habitat (2011 General Plan).
Tiquilia plicata fan-leaved tiquilia	Plant	None	None	N/A	N/A	Dunes, sandy gravel flats.	N/A	Moderate	Yes	Suitable habitat for this species is present on-site and the park is within Calscape's Estimated Plant Range. Calflora shows a record 1.5 miles southeast of the SVRA from 1938, as well as more recent observations further from the park. Park records from 2010 list this species.
Washingtonia filifera California fan plam	Plant	None	None	N/A	N/A	Groves, moist places, seeps, springs, streamsides.	N/A	Low	No	Suitable habitat is not present on-site, and the park is outside of Calscape's Estimated Plant Range. There is a local record, approximately 5.5 miles southwest of the SVRA, from 2021 but the species appears to be misidentified.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Xanthium strumarium cocklebur	Plant	None	None	N/A	N/A	Disturbed, seasonally wet, often alkaline sites, in grassland, marshes, watercourses.	N/A	Low	No	Suitable habitat is not present on-site, although adjacent property may contain suitable habitat. The park is within Calscape's Estimated Plant Range. There are no park records of this species. The nearest Calflora observations are approximately 6 miles from the SVRA - one from Calexico in 1904 and another near Meloland in 1916.
Xylorhiza orcuttii Orcutt's woody aster	Plant	None	None	1B.2	N/A	Arid canyons, barren slopes; creosote-bush scrub	N/A	Low	No	Marginal habitat is present on-site, but the park is outside of Calscape's Estimated Plant Range. This species was listed in informal park records, but no observation data was associated. It is presumed this list was generated with species present at other district units, rather than observations specifically from Heber Dunes SVRA. There are no local records of this species.
Aspidoscelis tigris Western whiptail	Reptile	None	None	N/A	IUCN: LC	Deserts and semiarid habitats, typically with sparse vegetation and open patches.	N/A	High	Yes	Suitable habitat is present on-site, and the park is within the known range of this species. Staff observed this species during pitfall trapping on 4/17/2018.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Chionactis annulata resplendent desert shovel-nosed snake	Reptile	None	None	N/A	IUCN: LC	Desert washes, dunes, sandy flats, loose soil, and rocky hillsides with sandy gullies or pockets of sand among rocks.	Scant vegetation - creosote bush, desert grasses, cactus, or mesquite.	Moderate	No	Suitable habitat is present on-site, and the park is within the known range of this species. The nearest iNaturalist observation is from 6/3/2015, approximately 3.4 miles northeast of the SVRA. An email exchange from past staff indicates that species has been observed in or before 2008.
Coleonyx variegatus Western banded gecko	Reptile	None	None	N/A	IUCN: LC	Desert. Creosote scrub, sagebrush, pinyon-juniper woodlands, and chaparral areas.	Often associated with rocks.	High	Yes	Suitable habitat is present on-site, and the park is within the known range of this species. Park staff last observed this species on 12/1/2017.
Coluber flagellum coachwhip	Reptile	None	None	N/A	IUCN: LC	Desert, prairie, scrubland, juniper-grassland, woodland, thornforest, and farmland.	Typically avoids dense vegetation.	High	No	Suitable habitat is present on-site, and the park is within the known range of this species. Last observed by park staff on adjacent Caltrans property on 5/11/2018. An email exchange from past staff indicates that species has been observed in or before 2008.
Crotalus atrox Western diamondback rattlesnake	Reptile	None	None	N/A	IUCN: LC	Arid and semi-arid regions - desert, grassland, shrubland, woodland, open pine forests, and rank growth of river bottoms.	Sandy flats to rocky upland areas.	High	Yes	Suitable habitat is present on-site, and the park is within the known range of this species. Heber Dunes staff observe this species on occasion. This species was last observed by park staff in 2019.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Crotalus cerastes sidewinder	Reptile	None	None	N/A	IUCN: LC	Desert. Most common in sandy creosote scrub but may also occur on windswept flats, barren dunes, hardpan, and rocky hillsides.	N/A	High	Yes	Suitable habitat is present on-site, and the park is within the known range of this species. The Heber Dunes General Plan states that this species is found in the SVRA's tamarisk dunes.
Dipsosaurus dorsalis desert iguana	Reptile	None	None	N/A	IUCN: LC	Creosote bush scrub with mixture of loose sand and firm ground with scattered rocks.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA and the park is in the species' range. This species was listed in the 2011 General Plan. Staff uploaded a picture on 4/28/2007.
Hemidactylus turcicus Mediterranean house gecko	Reptile	None	None	N/A	IUCN: LC	Desert. Human dwellings.	N/A	Moderate	No	Suitable habitat for this species is present within the SVRA. This species in nonnative to California but it has readily adapted to the environment. The nearest iNaturalist observation is from 11/17/2019 near Calexico, approximately 5.1 miles from the SVRA. Per a 2008 email exchange, this species may have been observed within the SVRA; however, the species could have been a western banded gecko as well.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Kinosternon sonoriense Sonoran mud turtle	Reptile	None	None	N/A	CDFW: SSC IUCN: VU	The lower Colorado River system in southeastern California.	Permanent slackwater habitats along intermittent or perennial streams with abundant submergent vegetation and benthic inverts.	None	No	Suitable habitat is not present within the SVRA or immediately adjacent. Per CNDDB, the last observation was in 1941 approximately 5 miles southeast of the park along the All American Canal and according to Jennings (1983), this species is extinct in California. This species has not been recorded within the park boundary.
Lampropeltis californiae kingsnake	Reptile	None	None	N/A	IUCN: LC	Coniferous forest, woodland, swampland, coastal marshes, river bottoms, farmland, prairie, chaparral, and desert.	Often found near rock outcrops and clumps of vegetation and under rotting logs, old lumber, and rocks.	High	Yes	Suitable habitat is present within the SVRA, and the park is in the known range of this species. This species was last observed within the SVRA in 2020.
Phrynosoma mcallii flat-tailed horned lizard	Reptile	None	None	N/A	BLM: S CDFW: SSC IUCN: NT	Restricted to desert washes and desert flats in central Riverside, eastern San Diego, and Imperial counties.	Critical habitat element is fine sand, into which lizards burrow to avoid temperature extremes; requires vegetative cover and ants.	Low	No	Suitable habitat is present for this species within the SVRA, but the surrounding landscape is not suitable. Per CNDDB, this species has possibly been extirpated due to regional conversion to agriculture. The park is within the historic range of the species, but the most recent CNDDB records were from the 1960s. iNaturalist shows recent records of this species east of the Alamo River (approximately 2.1 miles east of the SVRA), suggesting a population is present in remaining habitats.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Pituophis catenifer gopher snake	Reptile	None	None	N/A	IUCN: LC	Desert, prairie, brushland, woodland, open coniferous forest, and farmland.	Especially common in grassland and open brushland.	High	Yes	Suitable habitat is present within the SVRA, and the park is within the known range of this species. This species was last observed by park staff in 2019.
Sceloporus magister desert spiny lizard	Reptile	None	None	N/A	IUCN: LC	Arid and semiarid regions, including deserts, plains, and lower slopes of mountains.	N/A	High	Yes	Suitable habitat is present within the SVRA, but preferred slopes and rocky substrates are not present. The park is within the known range of this species. Per iNaturalist, the nearest observation is from 11/19/2018 approximately 1.4 miles northeast of the SVRA. Park staff observed this species in 2021.
Uma notata Colorado Desert fringe-toed lizard	Reptile	None	None	N/A	BLM: S CDFW: SSC IUCN: NT	Colorado Desert region; in sand dunes, dry lakebeds, sandy beaches or riverbanks, desert washes, or sparse desert scrub.	Requires fine, loose, windblown sand (for burrowing); shrubs or annuals for arthropod production.	Low	No	Suitable habitat is present for this species, but adjacent lands are not suitable due to conversion to agriculture, hindering potential recruitment. The nearest CNDDB record is approximately 10.2 miles northeast of the SVRA and north of Interstate 8 in the Glamis SW quad.
Urosaurus graciosus long-tailed brush lizard	Reptile	None	None	N/A	IUCN: LC	Desert. Areas of loose sand and scattered bushes and trees.	Creosote bushes with exposed roots favored.	High	Yes	Suitable habitat for this species is present on-site and the park is within the known range. Staff observed this species on 4/17/2018 during pitfall surveys.

Species Name	Taxon	Federal Status	State Status	CA Rare Plant Status	Other Status	General Habitat	Microhabitat	Potential to Occur within SVRA	Known to Occur within SVRA	Justification
Uta stansburiana side-blotched lizard	Reptile	None	None	N/A	N/A	Desert, various.	N/A	High	Yes	Suitable habitat for this species is present within the SVRA and the park is in the species' known range. Staff observed this species in December 2021.

Table Key:

CA Rare Plant Status: Information about CNPS rare plant ranks can be found at https://www.cnps.org/rare-plants/cnps-rare-plant-ranks.

Other Status: BCC=Bird of Conservation Concern, EN=Endangered, FP=Fully Protected, HP=High Priority, LC= Least Concern, LMP=Low-medium Priority, MHP=Medium-high priority, MP=Medium Priority, NT=Near Threatened, RWL=Red Watch List, S=Sensitive, SSC=Species of Special Concern, VU=Vulnerable, WL=Watchlist

8 APPENDIX 2: MANAGEMENT ACTION DETAILS

The goals and objectives of the WHPP guide the management of natural resources at Heber Dunes SVRA. Management actions are responses that can be taken to improve habitat, reduce impacts to habitat, respond to triggers, and attempt to reach success criteria that will progress the WHPP's goals and objectives. These actions are informed by the SVRA resource objectives, success criteria, and management triggers. All proposed management actions are compatible with the park's General Plan.

Implementing a management action, may require CEQA review. Once a project or action is planned, the district will assess whether the activity is subject to CEQA. If CEQA applies, review will commence using the State Parks Project Evaluation Form.

When a specific project or action is planned, CEQA review will commence using the State Parks Project Evaluation Form.

Listed below is a comprehensive list of management actions that are currently used or could feasibly be applied to meet WHPP objectives at the SVRA.

8.1 MANAGEMENT ACTIONS RELATED TO RESOURCE MANAGEMENT

1. Conduct restoration or other projects to meet the goals of the Heber Dunes SVRA Soil Conservation Plan, as needed.
2. Limit significant expansion of social trails within the Native Vegetation MU.
    a. Measures could range from lower intensity actions (i.e., use of interpretive messaging, signage, etc.) to high intensity (i.e., temporary or permanent closures, formal management as trails only area, etc.).
3. Manage spread of invasive species with chemical and mechanical controls throughout the unit.
    a. Control methods (e.g., opportunistic hand pulling, herbicide application, etc.) would be determined for the species of interest and its extent, as appropriate.
4. Use suitable avoidance measures (e.g., avoidance buffers, seasonal restrictions on work, exclusion zones, etc.) to minimize impacts to sensitive species.
5. Train park staff and volunteers on sensitive species that may be present in the SVRA. This training should consist of identification, avoidance measures, and reporting requirements.
6. Host up to two clean-up events at Heber Dunes SVRA annually.
7. Remove identified hazard trees or branches within 30 days of post-inspection notification.

8.2 Management Actions Related to Recreation and Facilities Activities

1. Plan and implement small scale projects in the Native Vegetation MU, such as removal of invasive species, planting native vegetation, and scrubbing volunteer trails.

8.3 Management Actions Related to Policy and Regulatory Compliance

1. Develop and implement a Heber Dunes SVRA Soil Conservation Plan by 2023.
2. Ensure project compliance per the California Environmental Quality Act.
    a. Document project impact and CEQA analysis on a State Parks Project Evaluation Form (DPR 183).
    b. Apply for project required regulatory permits.
    c. Incorporate Ocotillo Wells District's standard impact avoidance measures into projects.
    d. Conduct pre-construction surveys for sensitive species, including but not limited to breeding birds and special status plant and animal species prior to the start of construction activities, when appropriate.
    e. When burrowing owls are observed on site, Mitigation Measure Biology-1, which was identified in the park's General Plan, will be employed. Mitigation Measure Biology-1 states:

        > "In the event that western burrowing owl are discovered within a construction area or in an area that interferes with operation and management of Heber Dunes SVRA, CDFG [*sic*] will be consulted to determine the proper course of action, which may include avoidance or measures such as limiting construction to the nonbreeding season, burrow exclusion outside of the breeding season, collapsing of excluded burrows, and the creation of artificial burrows" (AECOM 2011)
3. If previously unknown wildlife species (sensitive and non-sensitive) are detected, assess the WHPP's adaptive management strategy, and, if found to be necessary, implement new or modified monitoring and management actions.
4. Per SB 249, temporarily or permanently close noncompliant areas until the WHPP is met.

9 APPENDIX 3: MONITORING METHODOLOGY

This appendix details the different types of monitoring, including performance indicators and methodology, that will occur to assess WHPP objectives. Some monitoring efforts are new to the SVRA and will require time to establish baseline and target conditions, as well as refine methods. During the pilot phase of monitoring, changes may be made to the methodology, and it may be several years until a protocol is established. This is normal for the introduction of changes to survey protocols and assessments. Changes to any monitoring will be addressed in future WHPP annual reports and updates.

9.1 VEGETATION COMMUNITIES MONITORING

9.1.1 Performance Indicator(s)

9.1.1.1 Description

Understand and manage the composition and distribution of habitats and associated vegetation communities throughout the unit.

9.1.1.2 Expectation

Conserve or improve the composition, distribution, and health of habitats and associated vegetation communities present at Heber Dunes SVRA.

9.1.1.3 Metric(s)

These metrics will be updated and evaluated biennially as part of the WHPP Report to OHMVRD.

1. Vegetation coverage percentage of the Native Vegetation MU.
2. Changes to landcover within the Native Vegetation MU over time.

These metrics will be updated and evaluated every five years during the WHPP update cycle, which will be reviewed by OHMVRD and NRD.

3. Fine-scale acreage and extent of vegetation communities at Heber Dunes SVRA.

9.1.1.4 Baseline

Landcover baseline to be established by 2025. Large-scale imagery and remote sensing monitoring will be a new effort at Heber Dunes SVRA that will begin in 2022. Early efforts will focus on ensuring property equipment and permitting is in order and initial data gathering to establish baseline conditions.

Vegetation community baselines were established in 2021 (Table 4). VegCAMP surveys were first conducted in 2021 for Heber Dunes SVRA, with ground-truthing occurring in spring 2022. This survey effort will serve as the baseline for future assessments. Data has also been mapped and stored within in ArcGIS Online geodatabase.

Table 4. Vegetation alliances identified for Heber Dunes in 2021-2022 VegCAMP mapping.

Habitat Type	Baseline Acres (2022 VegCAMP)
Arrow Weed Thickets Shrubland Alliance	31
Bare Sand	64
Bush Seepweed Shrubland Alliance	4
Creosote Bush Scrub Shrubland Alliance	52
Developed	10
Quailbush Scrub Shrubland Alliance	5
Tamarisk Thickets Shrubland Semi-Natural Alliance: Athel tamarisk	143
Tamarisk Thickets Shrubland Semi-Natural Alliance: saltcedar	25
Total VegCAMP Acres	**334**

9.1.1.5 Target(s)

Landcover target to be developed by 2025 following the establishment of baseline conditions. Generally, targets will focus on maintaining the extent of vegetation communities at the park.

1. By 2027, maintain the existing 92 acres of native vegetation communities throughout Heber Dunes SVRA.

9.1.1.6 Basis for Selection

Vegetation is an important component of any habitat and is often considered when assessing habitat condition and health. Vegetation presence and health is beneficial to habitats in numerous ways, including reducing soil loss from water or wind erosion (Castillo et al., 1997), lessening impacts of climate events and disturbances (Wright et al., 2017), and increasing species richness and influencing diversity (Sadoti et al, 2018; Cooper, 2018; Cooper et al., 2020). Additionally, many habitat factors influence vegetation health, including climate conditions (Hantson et al., 2021; Turner, 1990), land use and anthropogenic factors (Lovich and Bainbridge, 1999; Leu et al., 2008; Guo, 2004), and invasive species (Drake et al., 2016; Filazzola et al., 2020; Barrows et al., 2008). As a result of the broad importance of vegetation to a habitat, monitoring and improving vegetation cover benefit several resource categories at the SVRA.

Primary management considerations at the SVRA consist of maintaining existing extent of vegetation, particularly within the Native Vegetation MU. The MU contains the greatest diversity and continuous extent of native vegetation at the park unit.

Two methods were selected for ongoing monitoring. NDVI is a GIS tool that allows photosynthetically active vegetation to be measured within a given area. It allows land managers to map and visualize vegetation by health and distinguish them from non-vegetated areas. VegCAMP is a tool that similarly allows vegetation community and non-vegetated areas to be mapped, but health of given vegetation cannot be directly inferred. VegCAMP mapping is suitable for larger areas where changes are expected to occur at a slower rate, while NDVI allows for more focused analysis of areas where higher rates of change are anticipated, or the vegetation is more sensitive.

9.1.2 Methods

<u>NDVI</u>

Specific methodology to be established by 2024. District staff will work with GIS analysts and staff at Prairie City SVRA to learn more about the protocols in use at the park unit. The Ocotillo Wells district GIS analyst/drone pilot assisted Prairie City SVRA with their protocol development and will play an important role in fine tuning methodology for use at Heber Dunes SVRA.

NDVI is a GIS-based analysis that uses aerial imagery to measure the annual change in vegetation cover. NDVI measures the amount of near infrared light versus red light that is reflected from the surface of the earth. A NDVI value that is near one micrometer indicates a greener, healthier plant, while values close to zero indicate no vegetation is present and negative values indicate development or water.

Based on early discussions, tentative methodology would consist of using drones to capture high-resolution aerial imagery of the Native Vegetation MU every other year. Drone surveys would likely occur in the spring when vegetation growth is at its peak. Imagery collected would then be run through the NDVI tool in ArcMap. Data from this analysis would allow staff to assess vegetation coverage and health. Selective ground truthing will likely be required, especially in early years, as staff refine the protocol. The protocol will be appended to the annual WHPP report.

VegCAMP

VegCAMP classifies vegetation according to the standards of the National Vegetation Classification System (NVCS) and Survey of California Vegetation standards, which are hierarchal classifications of vegetation types, distinguishing alliances at the finest scale. Aerial imagery is used to identify vegetation alliances and/or associations at a minimum 1-acre scale. Special stands, such as wetlands or vernal pools, are mapped at a ¼-acre scale. Further information about CDFW's VegCAMP program and protocols can be found at Vegetation Publications, Protocols and Standards.

9.1.3 Program Risks and Uncertainties

NDVI is a useful tool for monitoring vegetation, but staff will need to use an array of other data, such as condition assessments within the MU and climate data, to assess whether changes were based on local or regional factors. As with all data, it is important to understand the underlying influences of increases or decreases. Climatic factors, such as precipitation, temperature, and sunlight, are strong influences on vegetation health. With analysis occurring biannually, it will be important to pay attention to ongoing climate conditions.

Using NDVI analysis requires access to high-quality imagery, which can be challenging to obtain in the area. A drone may be the most reliable source of imagery. The district currently has a trained drone operator but existing equipment, specifically the camera, is not suitable for multi-spectral imagery. With only one trained operator, staffing changes in the future could reduce the ability to consistently fly the MU and poses a risk to consistency of survey timing.

OHMVRD staff are currently required to complete VegCAMP mapping efforts. Staff changes between WHPP updates and sampling efforts will result in a knowledge gap in completing the mapping. If this mapping transitioned to district or SVRA responsibility, existing staffing may not be sufficient to absorb the task. Future training and management of this gap will be necessary.

9.2 INVASIVE SPECIES

9.2.1 Performance Indicator(s)

9.2.1.1 Description

Maintain or reduce the spread of invasive plant species at Heber Dunes SVRA.

9.2.1.2 Expectation

Map the extent of invasive plant species throughout the unit, and work to control or reduce the presence and distribution of invasive plant species within Heber Dunes SVRA.

9.2.1.3 Metric(s)

These metrics will be updated and evaluated annually as part of the WHPP Report to OHMVRD.

1. Acres and location of habitat within Heber Dunes SVRA where invasive plant species are present.
2. Acres and location of habitat within Heber Dunes SVRA treated for invasive plant species.

9.2.1.4 Baseline

Baseline spatial extent of invasive plant species at Heber Dunes SVRA to be established by 2024. Formal mapping of invasive plant species has not occurred at the park unit, although some data is available for specific species. VegCAMP surveys in 2021 identified that saltcedar is dominant in 25 acres of the SVRA (Figure 8). Other species, such as Russian thistle, have been identified in limited areas of the unit opportunistically.

9.2.1.5 Target(s)

To be developed by 2025 following the establishment of baseline conditions. Generally, targets will focus on maintaining the quality and health of native or naturalized habitats present at Heber Dunes SVRA, specifically related to managing and preventing the spread of invasive plant species at the unit.

1. By 2027, remove five acres of saltcedar from Heber Dunes SVRA.

9.2.1.6 Basis for Selection

Invasive species are organisms that cause ecological or economic harm in an environment they were introduced to and have the potential to significantly impact or harm natural resources in that ecosystem. Many times, invasive plants can outcompete native species as they often

produce large quantities of seed, are tolerant of disturbance, may have aggressive or dense root systems, can rapidly spread, and may alter the environment to inhibit other species. Invasive species are known to cause declines in native species, reducing plant diversity and degrading habitat, and altering soil composition and nutrients. Management of invasive species is a recurrent resource management concern in many systems.

It is important to note that not all non-native species are invasive, which is why management at Heber Dunes SVRA focuses on select species of concern that are likely to cause ecosystem harm. Currently, two species of concern have been identified – Russian thistle and saltcedar. Monitoring efforts will aim to detect if other invasive species are present at the unit. Efforts will be prioritized by proximity to native vegetation at the park.

A small population of Russian thistle was observed at the SVRA in 2021. This species has a variable rate of spread and may not pose an invasive threat at the unit. Initial monitoring will assess the appropriate threat level of the species. Russian thistle may be of concern due to its tendency to establish in disturbed and sandy soils, and abundant seed production.

Saltcedar is known to occur at the SVRA and, in the southwest, is a widespread invasive of concern. The species does not appear to spread rapidly at Heber Dunes SVRA, but it can increase salinity levels of the soil and alter site suitability for native species. Athel tamarisk was not identified as a species of management concern.

9.2.2 Methods

The 2020 Ocotillo Wells District Invasive Management Plan provides a framework for management of invasive species throughout the district. While the best control of invasive species is prevention, it is not feasible to stop all incursion. It is important to inventory and monitor so that species can be detected soon after invasion before they are established in an area or have established a large seed bank. Early Detection and Rapid Response (EDRR) surveys play an important role in locating and removing potential invasive species before they spread and cause harm.

Initial EDRR surveys will occur annually, generally in spring, during initial mapping efforts. Surveyors will systematically search the SVRA for potential invasive species. When detected, individuals or stands will be mapped using ArcGIS. Records will be kept of the location of surveyed areas, surveyors, date, and observations. New species that are detected, will be assessed, and removed quickly to avoid potential spread. Once baseline conditions are developed, monitoring frequency will be reassessed. The protocol will be appended to the annual WHPP report.

Removal methodology would be selected based upon for each species of focus and targeted area. Depending on project goals, numerous removal options could be considered including

biological, chemical, educational, and mechanical. At Heber Dunes SVRA, a mixture of chemical, educational, and mechanical controls are the likeliest to be used.

Saltcedar often requires mechanical and chemical treatment as the species is highly resilient and easily resprouts without herbicide application. Mechanical removal may consist of hand pulling, cutting, or using heavy equipment to pull individuals or mow stands. Chemical treatment would follow cutting or mowing to suppress resprouting. Currently, control of Russian thistle seems manageable with mechanical removal. Due to the smaller size of the plants, hand pulling is appropriate. As with all hand removal, effort should be made to remove the taproot. Interpretive messaging could easily be incorporated into any project, should staffing levels allow for it. Treated areas will be mapped in ArcGIS.

Following removal efforts, it is important to monitor treated areas to learn more about the effect of treatment on targeted species. Methods would be identified that are specific to a project. This type of monitoring provides management information about the effectiveness of control treatments towards meeting objectives and can be assessed over multiple years to show trends over time. It also helps refine removal methodology for a given location and target species. In certain areas, this monitoring can also be expanded to learn more about the effects of treatment on non-targeted species.

9.2.3 Program Risk and Uncertainties

Invasive plant species are an ongoing threat to park management, but dedicated surveys cannot occur with the same frequency. While efforts will made to consistently survey the SVRA, there are no dedicated resources staff available at the unit to complete this task. District staff should work closely with maintenance staff to ensure that potential species of concern are able to be identified by park staff and that, when observed, district staff is notified shortly after observation to avoid rapid spread of new invasive species.

9.3 Sensitive Species Avoidance Monitoring

9.3.1 Performance Indicator(s)

9.3.1.1 Description

Conserve sensitive species over time throughout Heber Dunes SVRA.

9.3.1.2 Expectation

Avoid and/or minimize impacts to sensitive species that may be present at Heber Dunes SVRA through inventory and pre-construction presence-absence surveys.

9.3.1.3 Metric(s)

These metrics will be updated and evaluated annually as part of the WHPP Report to OHMVRD.

1. Individual bat species auditorily recorded at Heber Dunes SVRA by season and recurrence.
2. Location of identified or probable bat roosting habitat at Heber Dunes SVRA.
3. Presence or absence of burrowing owl annually at Heber Dunes SVRA. If present, the location, and approximate dates the individual(s) were present will be recorded.
4. A list of projects that occurred at Heber Dunes SVRA that had the potential to impact sensitive species. For each project, sensitive species that were observed in or around the project area during pre-construction surveys, successful avoidance, or observed impacts will be denoted.

9.3.1.4 Baseline

Baseline conditions vary by taxon and methodology; baseline conditions will be established for all taxon by 2024. Project specific baselines may be utilized when pre-construction surveys are utilized.

Bats

Between 2019 and 2021, 13 total bat species have been auditorily observed at Heber Dunes SVRA, including seven sensitive species (Table 5). Assessment of bat roosting habitat has never occurred at the unit; baseline conditions will be established by 2024.

Birds

Burrowing owl are known to be present on occasion within the SVRA. Other sensitive species have the potential to be present and baseline conditions will be established for individual projects.

Plants

Sensitive plant species have the potential to be present. Baselines will be established for individual projects.

Table 5. Acoustic Detections from 2019-2021 at Heber Dunes SVRA (Alvarez 2021)

Species	Status	2019 Detection	2020 Detection	2021 Detection	More Data Required	N	%
Arizona Bat *Myotis occultus*	SSC	S, F	F	S	Yes	6	43
Big Brown Bat *Eptesicus fuscus*	N/A	S, F	F	S, F	No	11	79
Big Free-tailed Bat *Nytcinomops macrotis*	SSC	S, F	F	S, F	No	11	79
California Leaf-nosed Bat *Macrotis californicus*	SSC	N/A	F	N/A	Yes	1	7
California Myotis *Myotis californicus*	N/A	F	F	S	No	3	21
Canyon Bat *Parastrellus hesperus*	N/A	N/A	F	N/A	No	1	7
Hoary Bat *Lasiurus cinereus*	N/A	S	F	S, F	No	8	57

Species	Status	2019 Detection	2020 Detection	2021 Detection	More Data Required	N	%
Mexican Free-tailed Bat *Tadarida brasiliensis*	N/A	S, F	F	S, F	No	14	100
Pocketed Free-tailed Bat *Nyctinomops femorosaccus*	SSC	S, F	F	S, F	No	13	93
Western Mastiff Bat *Eumops perotis*	SSC	F	F	S	No	5	36
Western Red Bat *Lasiurus blossevillii*	SSC	S, F	F	N/A	No	9	64
Western Yellow Bat *Lasiurus xanthinus*	SSC	S, F	F	S	No	12	86
Yuma Myotis *Myotis yumanensis*	N/A	F	F	S, F	No	9	64

Table Key:

"SSC" = California Species of Special Concern. Detections are denoted by observation season; "S" = Spring and "F" = Fall.

9.3.1.5 Target(s)

To be developed by 2024 following the establishment of baseline conditions. Generally, targets will focus on understanding and maintaining the quality and health of sensitive species present at the unit.

9.3.1.6 Basis for Selection

Conservation of rare and sensitive species is a core value of State Parks, which was reinforced by the passage of SB 249. There are currently no endangered or threatened species resident to Heber Dunes SVRA, but several rare or sensitive species have the potential to occur. Through improving staff's understanding of the resources that are present at the unit, and by using that knowledge to incorporate avoidance measures into projects, State Parks can steward resources at the park.

Bat species have historically been understudied, which is the case at Heber Dunes SVRA. A robust inventory will allow park management to be better informed potential repercussions or benefits of actions that are taken. Similarly, while limited roost habitat is presumed to be present at the unit, investigating the likelihood of roosting will better inform management. For sensitive birds and plants, focus will primarily be on reducing project impacts through implementation of successful avoidance measures.

9.3.2 Methods

<u>Bats</u>

Passive acoustic recording of bat calls will occur twice per year in summer and winter at three locations at Heber Dunes SVRA. SM4 bat detectors are allowed to run for approximately one month, beginning recording one hour before sunset and continuing until one hour after sunrise. Data is analyzed Using Kaleidoscope 4.0.1 software and/or Sonobat 4.0, with review by an experienced bat biologist. Ambiguous recordings are discarded. The protocol is included in annual acoustic bat survey monitoring reports provided by Division contractors, and the report is attached to the annual WHPP report.

A protocol to evaluate roost sites, particularly for the pallid bat and California leaf-nosed bat (Stokes, personal communication), and identify probable locations will be established in conjunction with Division contractors that have subject matter expertise. It is expected that locations will be surveyed periodically for visible sign or direct observations of bat presence. Once established, the protocol will be appended to the annual WHPP report.

Future efforts may consider the use of mist netting in addition or in lieu of auditory recording to improve confidence in species' presence.

Birds

Annual presence absence surveys will occur at Heber Dunes SVRA to identify if burrowing owl are present or not. A protocol based on CDFW's 2012 Staff Report on Burrowing Owl Mitigation and The California Burrowing Owl Consortium's 1993 Burrowing Owl Survey Protocol and Mitigation Guidelines will be modified for use at Heber Dunes SVRA. Existing protocols are based for construction mitigation and require an initial habitat assessment, which is not necessary at Heber Dunes SVRA as burrowing owl have been previously observed and the entirety of the park could be utilized for foraging and/or nesting. Broadly, surveys should be repeated at least three times during the breeding season, defined as February 1st to August 31st, with each survey occurring several weeks apart. Non-breeding season surveys are currently not deemed appropriate as the park has not historically been used as wintering habitat. Once established, the protocol will be appended to the annual WHPP report.

Ideally, projects will be scheduled to avoid the breeding bird season to maximize avoidance, but if projects cannot be rescheduled, pre-construction surveys will be completed no more than one week prior to work. Pre-construction surveys will be required for any projects that occur during the breeding bird season, which is broadly defined in California as February 1st through August 15th. Surveyors will conduct point or transect surveys to identify species that are in the project area and buffer zones. Acoustic recordings may be used. If sensitive species are observed, an Environmental Scientist will prescribe appropriate minimization measures including, but not limited to, avoidance buffers, a biological monitor, and project postponement. The annual WHPP report will include a summary description of method(s) used for each project, observed sensitive species, avoidance measures prescribed, and measure success.

Plants

Pre-construction plant surveys will be conducted in the project area and an appropriate buffer around the work area and routes of travel, when working in areas that have a potential for sensitive plant species to occur. Surveys will consist of transects in suitable habitat. If sensitive plants are observed, they will be flagged for avoidance for the duration of work and a GPS point will be collected. A biological monitor may be on-site during work, at the discretion of an Environmental Scientist.

9.3.3 Program Risks and Uncertainties

Differing levels of effort will likely be required year-to-year depending on the number of projects that occur at the unit, and the presence of sensitive species relative to the projects. As monitoring proceeds, it will be important to assess the typical level of effort required to ensure staff capacity can meet demand. Staff will also need to be trained in protocol-level surveys, particularly if biologist requirements or trainings are implemented. While surveys will occur as

appropriate, there is always risk that a species is present but remains undetected during surveys. Monitoring may be an appropriate avoidance option when repeat surveys to ensure adequate detection probability are not feasible.

The species inventory will need to be regularly evaluated for updates and status changes to capture changes over time. Similarly, best available science regarding species avoidance may change over time or fine-tuned for various habitats. These changes will be important to capture throughout each iteration of the WHPP.

9.4 Trash Clean-Up

9.4.1 Performance Indicator(s)

9.4.1.1 Description

Anthropogenic, non-organic trash and micro-trash pose risks to wildlife and reduce habitat quality.

9.4.1.2 Expectation

Reduce non-organic trash, and micro-trash, from Heber Dunes SVRA to reduce wildlife and habitat impacts.

9.4.1.3 Metric(s)

These metrics will be updated and evaluated annually as part of the WHPP Report to OHMVRD.

1. Projected priority treatment acreage within SVRA.
2. Acres of treated areas following cleanup events.

9.4.1.4 Baseline

A well-established baseline of existing trash does not exist; however, staff have anecdotal knowledge about the density and frequency of build-up in areas of the park. As cleanup events begin in 2023, baseline conditions will be better understood. Early efforts will focus on identifying priority areas for treatment, with cleanup events targeting those areas.

9.4.1.5 Target(s)

This objective will be achieved through clean-up events. Specific targets will be developed per clean-up event and reported within annual reports.

9.4.1.6 Basis for Selection

Windblown trash accumulates underneath vegetation stands at Heber Dunes SVRA. The removal of this trash will improve habitat quality, as well as other resource categories, for many species at the unit (Browne et al., 2015). Additionally, cleanup events allow visitors to actively contribute and benefit the park unit, creating stronger stakeholder bonds over time.

The primary focus of any cleanup event is to target a select subsection of the park. Individual cleanup events may also have a collection goal (i.e., targeted weight of collected trash or other metric) that will serve as motivation to volunteers. Without a clear understanding of how much trash is currently on-site, this metric will likely have limited management implications beyond event goal setting. Tracking the acres of individual clean-up events and estimated improvement, will be the primary focus.

9.4.2 Methods

Locations will be inventoried based on anecdotal or opportunistic staff knowledge of problem areas and periodic informal assessments of areas that are likely to be problem areas. These different locations should be prioritized for treatment across the unit. Priorities should be periodically assessed as needed to ensure areas of concern are focused on.

Prior to the cleanup, volunteers should be recruited through social media, posters, park newsletter, and other mediums. Additionally, supplies for the event should be prepared including disposable gloves, garbage bags, hand sanitizer, and a scale (i.e., luggage or fishing scale). On the day of the event, park staff should be available to assist with volunteer waiver forms, present a safety and resource briefing, help with the cleanup, and track the acres treated. If historic resources may be present, the district historic resources guide should be shared with volunteers and a briefing should be conducted.

Organizations that regularly conduct community cleanup events have helpful resources about event preparation. These guides will be used to develop a more in-depth protocol for the park during 2023. The protocol will be appended to the annual WHPP report.

9.4.3 Program Risks and Uncertainties

It is uncertain how much trash is currently on-site, which makes it challenging to estimate need. However, trash will likely be an ongoing management issue at the unit to ensure ongoing accumulation does not exceed removal activities. While staff efforts are easy to schedule, coordinating volunteers at the park unit may prove to be challenging. In the future, it may be worth coordinating with a group that regularly organizes cleanup events to cohost events in the future (i.e., Clean-Dezert).

9.5 SCIENTIFIC MONITORING

9.5.1 Taxa Monitoring

Avian Methodology

Three avian plots are surveyed biennially at Heber Dunes SVRA – once in spring and again in fall. Plots are located within saltbush, arrow weed, and dune habitats. Each plot consists of a point-count transect. At each point within the transect, surveyors observe birds for five minutes before moving to the next point. Observations made while surveyors move from one point to another are recorded.

In 2021, resource staff worked with The Institute for Bird Populations to field test Autonomous Recording Units (ARU) at Heber Dunes SVRA. These stations are easy to set up, and record ambient sound, including bird calls. During initial testing, ARU were set out at designated points along existing survey transects and left running for a week. Recordings can then be analyzed by a trained surveyor or bird call software analysis programs. Depending on results from the first year of surveys, ARU may be used to augment or replace in-person surveys in the future.

The protocol will be appended to the annual WHPP report.

Reptile Methodology

Reptile monitoring has previously occurred at Heber Dunes SVRA using visual searches of transects and pitfall trapping. Neither method was overly successful and reptile monitoring was discontinued in 2019. Periodic reptile monitoring may occur in the future using different methodology, and the protocol would be attached to the annual WHPP report.

Small Mammal Methodology

Four transect lines are surveyed at Heber Dunes SVRA biannually – once in spring and once in fall – using Sherman live traps to capture small mammals. Two plots contain twenty-five traps, while two others contain fifty traps. Traps are opened and baited with a seed and peanut butter mixture overnight, then checked and closed in the early morning to limit risk to diurnal species. The protocol will be appended to the annual WHPP report.

9.5.2 Weather Data

A HOBO USB Micro Station weather station (H21-USB) was installed within the maintenance yard at Heber Dunes SVRA in fall 2021. The weather station continually collects data for local precipitation, daily temperature, relative humidity, wind speed and direction, as well as gust speed. Data is periodically collected by district staff and imported into the habitat monitoring database.