Ocotillo Wells State Vehicular Recreation Area

2025 Soil Conservation Plan

Prepared by:

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

February 2025

TABLE OF CONTENTS

LIST OF FREQUENTLY USED ACRONYMS

ABDSP®	Anza-Borrego Desert State Park®
BAS	Best Available Science
S-22	Borrego Salton Seaway
BLM	Bureau of Land Management
CARB	California Air Resources Board
CDCA	California Desert Conservation Area
CEQA	California Environmental Quality Act
CGS	California Geological Survey
DPR	Department of Parks and Recreation
DRECP	Desert Renewable Energy Conservation Plan
DCP	Dust Control Plan
FEIS	Final Environmental Impact Statement
ICAPCD	Imperial County Air Pollution Control District
LUPA	Land-Use Plan Area
MU	Management Unit
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standard
OWSVRA	Ocotillo Wells State Vehicular Recreation Area
OHV	Off-highway Vehicle
OHMVRD	Off-Highway Motor Vehicle Recreation Division
PM_{10}	Particulate Matter Less Than 10 Microns in Diameter
PRC	Public Resource Code
RAMP	Recreation Area Management Plan
SPEO	State Park Equipment Operator
SSAB	Salton Sea Air Basin
SCP	Soil Conservation Plan
SR	State Route
SVRA	State Vehicular Recreation Area
TDS	Tierra Del Sol
WHPP	Wildlife Habitat Protection Plan

1 INTRODUCTION

The Ocotillo Wells State Vehicular Recreation Area (Ocotillo Wells SVRA; OWSVRA) provides 86,238 acres of off-highway vehicle (OHV) recreation in San Diego and Imperial Counties. The California Department of Parks and Recreation (DPR; State Parks) manages Ocotillo Wells SVRA

policies, as defined in the Department Operations Manual. The PRC requires each SVRA to demonstrate compliance with the 2020 Soil Conservation Standard; this document describes the framework for ensuring compliance.

1.1 2020 SOIL CONSERVATION STANDARD

Updates to PRC §5090.35(b)(1) in 2017, required the Off-Highway Motor Vehicle Recreation Division (OHMVRD; Division) to "review, and, if deemed necessary, update the 2008 Soil Conservation Standard (the Standard) and Guidelines to establish a generic and measurable soil conservation standard." This Standard is meant to ensure appropriate resource management and maintenance in areas of OHV use, including SVRAs. Following the review, the OHMVRD updated the 2008 document to create the 2020 Soil Conservation Standard and Guidelines to provide clarity and account for technological changes in vehicles used for OHV recreation.

In full, the 2020 Soil Conservation Standard (the Standard) states:

> Off-highway vehicle recreation facilities shall be managed for sustainable long-term prescribed use without generating soil loss that exceeds restorability, and without causing erosion or sedimentation which significantly affects resource values beyond the facilities. Management of OHV facilities shall occur in accordance with Public Resources Code, Sections 5090.2, 5090.35, and 5090.53.

The Ocotillo Wells SVRA Soil Conservation Plan (SCP) has been developed to demonstrate adherence to the 2020 Standard by documenting assessment, maintenance and monitoring actions related to OHV road and trail management. A compliance report and action plan will also be incorporated as part of the SCP to document activities and projects undertaken to comply with the Standard and to detail planned actions and projects aimed at improving soil conservation efforts at the OHV recreational facility.

1.2 RELATIONSHIP WITH OTHER PLANS

An SCP is only one of several planning documents used at State Parks, so it must relate to and complement other park plans (Figure 1). In 1982, the General Plan was adopted for Ocotillo Wells SVRA which guides the management for all aspects of the SVRA. An updated general plan is currently in process, detailed below. The District started the Wildlife Habitat Protection Plan (WHPP) in 2022 with implementation anticipated in 2025. The WHPP will address compliance with PRC §5090.35(c) (1) requirements to improve and conserve wildlife habitat. While the SCP

and WHPP focus on different resources, they were designed to be complementary as there is overlap between the two documents. Additionally, a Dust Control Plan was developed in 2013 (Tetra Tech 2013) for the park unit and is updated biennially. The most recent update was in 2023.

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

1.2.1 General Plan Update

State Park General Plans are broad, 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 be used for 20 years or longer so it must provide a long-term vision, while providing flexibility for responding to changing conditions.

Revisions on the General Plan began in 2008 to include updates to park management practices and incorporate recent land acquisitions, including the Truckhaven property north of S-22 (sometimes referred to as the “Freeman property”). Beginning in 2015, DPR and BLM began to develop a joint planning document that would update BLM’s Land-Use Plan Area (LUPA) and Recreation Area Management Plan (RAMP) for consistent management between BLM and DPR. In 2018, the general plan update was paused due to a change in federal administration. In 2023, the process has resumed.

During the initial update process, several alternatives for future park management were identified and evaluated for potential environmental and recreational impacts. Based on the analysis of these alternatives, one preferred alternative was selected. This preferred alternative considers the transition of some lands from open riding to trails only riding, changes to camping

designations, and the designation of concentrated OHV recreation areas within portions of the SVRA (California State Parks, 2016). The update will also consider the future of joint management or potential transfer of lands from the federal government to the state. At several stages in the environmental review process, opportunities for public comment and review will be available.

The process of preparing a general plan can take several years. A firm completion date is not yet known, but it is anticipated that the process will take at least three years.

1.2.2 Dust Control Plan

Imperial County Air Pollution Control District (ICAPCD) Rule 800 [General Requirements for Control of Fine Particulate Matter (PM_{10})] requires a dust control plan (DCP) for operations capable of generating fugitive dust (PM_{10}) from anthropogenic sources. In 2017, a DCP was finalized for both Ocotillo Wells and Heber Dunes SVRAs in Imperial County. An update to the DCP was completed in 2023. The DCP will be subsequently updated and submitted to the ICAPCD every two years.

The DCP listed dust control measures include watering, applying a uniform layer of washed gravel, paving, restricting access, restricting speed limit to or below 15 miles per hour, applying chemical or organic dust suppressant, applying roadmix, or any other method that demonstrates an effectiveness to limit visible dust emissions to 20% opacity.

In 2014, a multi-year pilot study testing various dust control treatment methods began at Ocotillo Wells SVRA. This pilot study focused on testing different types of binding agents such as lignosulfonate, magnesium chloride, calcium chloride, and “Durasoil”. These binding agents were tested on sections of designated trails such as Roadrunner Trail, Mesa Trail, Main Street, Quarry Road, Shell Reef Expressway, Wolfe Well Road, Ocotillo Road, County Line Road, Holmes Camp Road, Cooksy Trail, and Cahuilla Trail. Additionally, other measures such as speed limit signs and hay bales were also tested. Due to the flat-tailed horned lizard (*Phrynosoma mcallii*) California Endangered Species Act candidacy in 2015 - 2016 the pilot study was unable to be completed as ground disturbance was greatly limited, including grading and spraying activities.

Currently, the primary dust control measures used within the park include watering, haybales, speed limit signs, and dust control agents. Lignosulfonate (commonly referred to as lignin) is the main dust control agent used at the park; it is generally applied every couple of years. The product is customarily applied to the first quarter mile of designated trail entrances from the highway.

1.3 CEQA Compliance

The SCP identifies resource objectives along with general types of projects and/or actions that can or will be taken to ensure progress on meeting the SCP objectives. The California

Environmental Quality Act (CEQA) process begins at this stage. If discretionary projects or actions are identified, State Parks will follow Department procedure for meeting CEQA compliance. 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.

1.4 Update Cycle

This SCP will be reevaluated at least once every five years. The SCP is meant to be a living document with changes incorporated to ensure conditions are documented and actively improved. All maintenance and monitoring plans included in the document will be updated as necessary.

1.5 Adaptive Management

Adaptive management is a common strategy and fundamental component of implementing best available science (BAS) in natural resource management. PRC §5090.14 defines the use of adaptive management as:

> "*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.*

An adaptive management loop for a SCP includes an assessment of park resources and facilities, defining objectives based on those conditions, targeting maintenance and management to meet objectives, monitoring to determine success of maintenance and management actions, and determining necessary adjustments. The Ocotillo Wells SCP will define the adaptive management approach that guides soil conservation at the SVRA.

2 Project Area

2.1 Location and Regional Context

Ocotillo Wells SVRA is one of five properties managed by the Ocotillo Wells District of DPR (Figure 2). OWSVRA is an 86,238-acre OHV park within the Colorado Desert, a sub-region of the Sonoran Desert, and relatively remote. It is approximately 90 miles northeast of San Diego and is bordered by Salton City on the east, the community of Ocotillo Wells and BLM land to the south, and Anza-Borrego Desert State Park® (ABDSP®) to the north and west. Approximately 17% of the SVRA is in San Diego County and the other 83% is in Imperial County (Figure 2). The closest urban areas are Brawley and El Centro, approximately 40 and 50 miles, respectively, to the southeast; and Indio, approximately 40 miles north of the SVRA. The area is accessible by regional transportation routes such as State Route (SR) 78 and SR-86 (Figure 3).

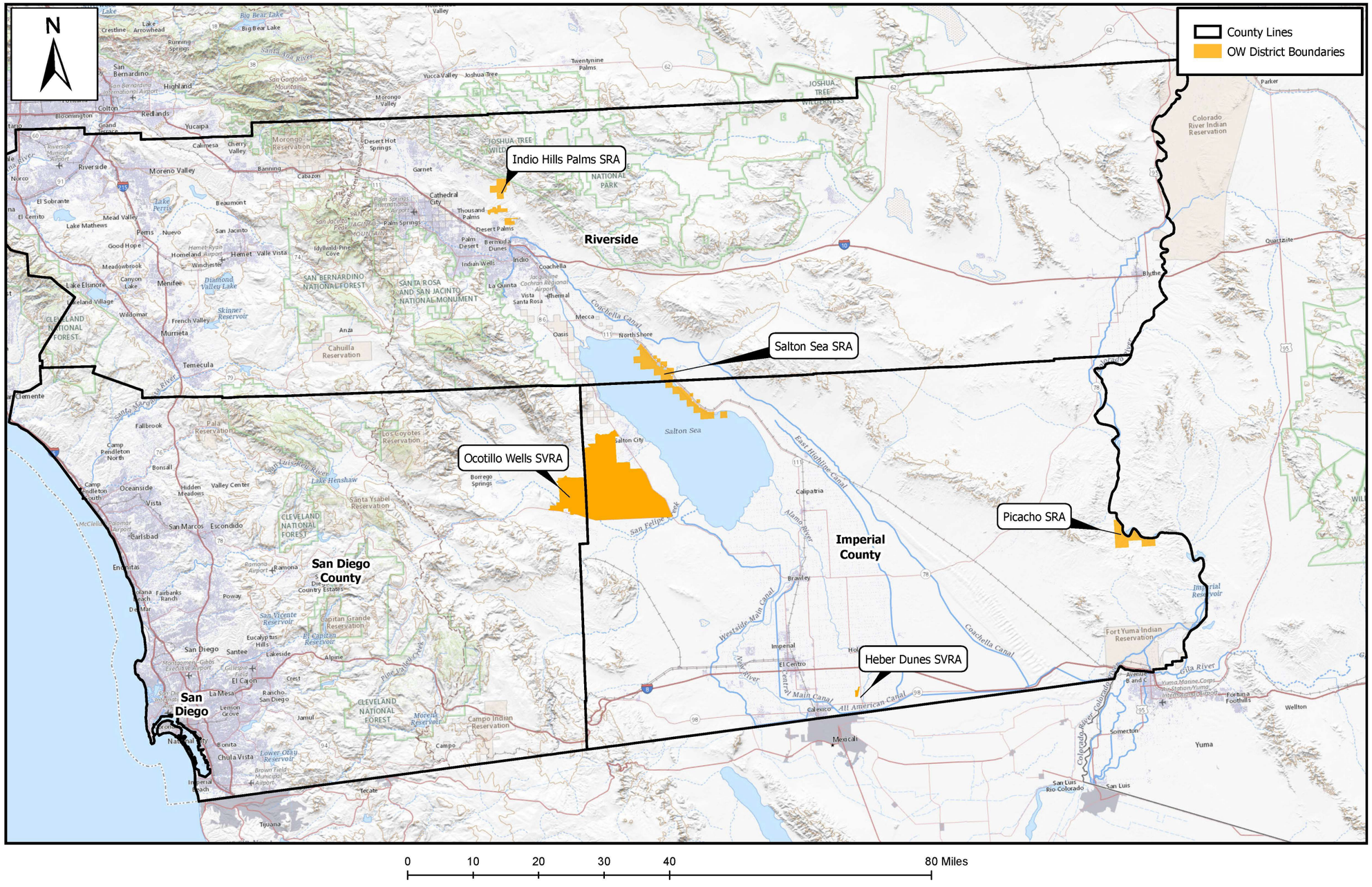


Figure 2. Park units in Ocotillo Wells District

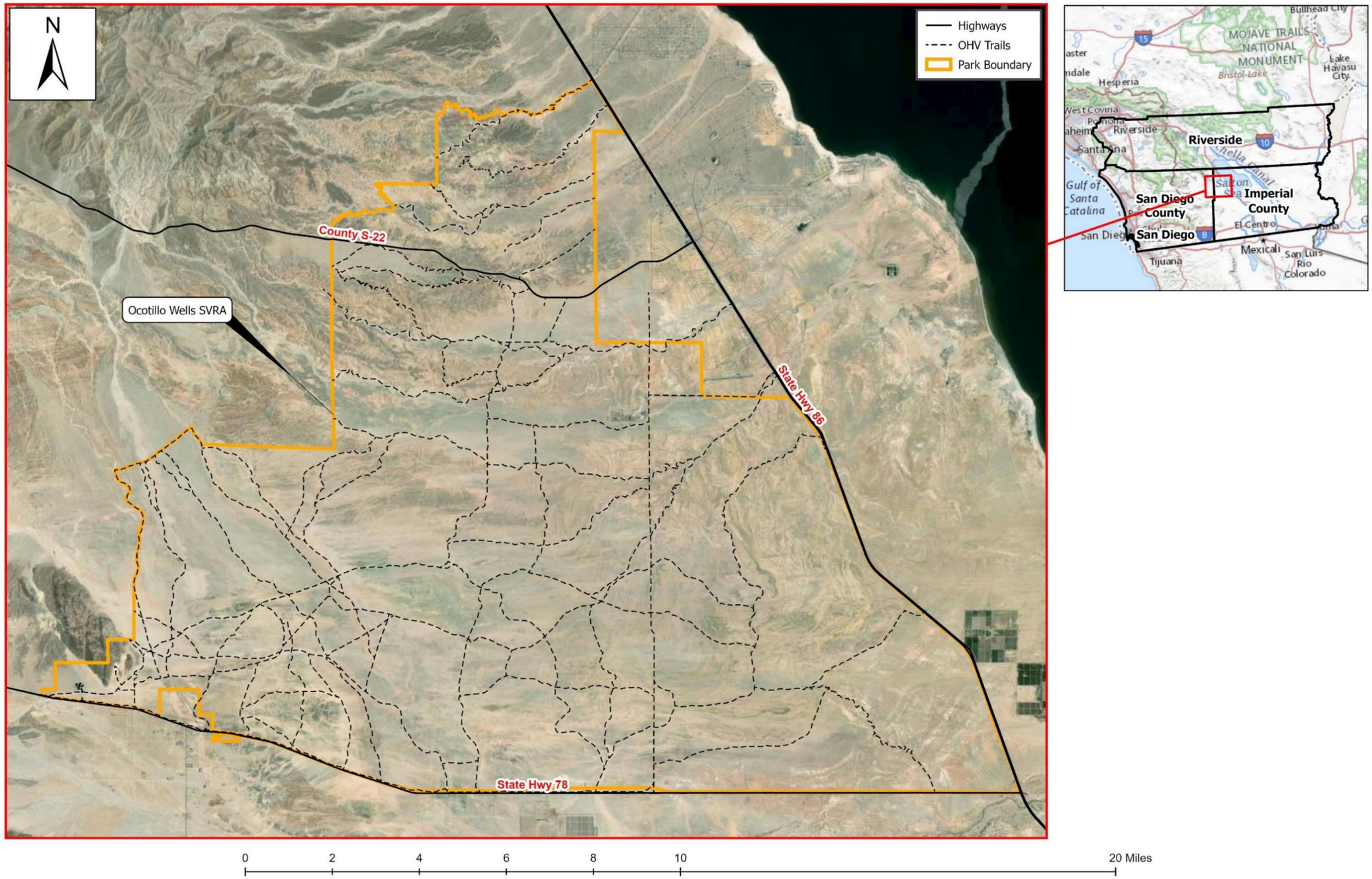


Figure 3. Regional location of Ocotillo Wells SVRA.

2.1.1 Regional Land Use

Ocotillo Wells SVRA is surrounded by mostly open desert. ABDSP® forms the western and northern boundaries of Ocotillo Wells SVRA. Farther north is the Torres-Martinez Reservation. To the east, SR-86 and the community of Salton City forms the majority of the boundary. Immediately south of Salton City and adjacent to SR-86 is undeveloped land with mixed ownership. To the south, the park is bounded by SR-78. South of the highway is a mixture of BLM and private ownership and includes the community of Ocotillo Wells.

About 60% of the total SVRA area is designated for open ride, which does not limit OHV riding to specific trails. The remaining 40% of the park provides OHV recreational opportunities on official, designated trails only. Land ownership in the SVRA is complex with private (7,849 acres), California State Lands Commission (SLC) (1,969 acres), and U.S. Bureau of Land Management (BLM) parcels (21,272 acres) dispersed throughout the SVRA (Figure 4). BLM parcels are managed by OWSVRA under a Memorandum of Understanding (MOU) between the two agencies. Private inholdings and SLC owned lands are not managed by DPR.

The Salton City Landfill is located within the boundaries of Ocotillo Wells SVRA. Various utilities run through the park that are owned by the county or Caltrans through a Right of Way. These utilities are generally associated with powerlines along Poleline Road and do not impact park operations.

2.1.1.1 Private Inholdings

Much of the 7,849 acres of private land or inholdings within Ocotillo Wells SVRA are undeveloped or have minimal development. Development typically consists of fencing to delineate property boundaries and storage containers. Inholdings with minimal development are generally used as a temporary camp, either for a weekend of riding or longer-term use during the cooler times of the season. One inholding in particular, was designated as The Republic of Slowjamastan by the landowner and holds infrequent gatherings and is seen as an attraction.

2.1.1.1 BLM

BLM owns approximately 21,272 acres within Ocotillo Wells SVRA and has agreed to allow DPR surface management authority on BLM-owned public lands within the park boundary (BLM and DPR 2008). Additionally, the BLM land ownership continues south of SR-78 with a mix of private owned land, California Department of Fish and Wildlife (CDFW), and U.S. Department of Defense. A variety of recreational activities occur on BLM owned lands including motorized and nonmotorized recreation.

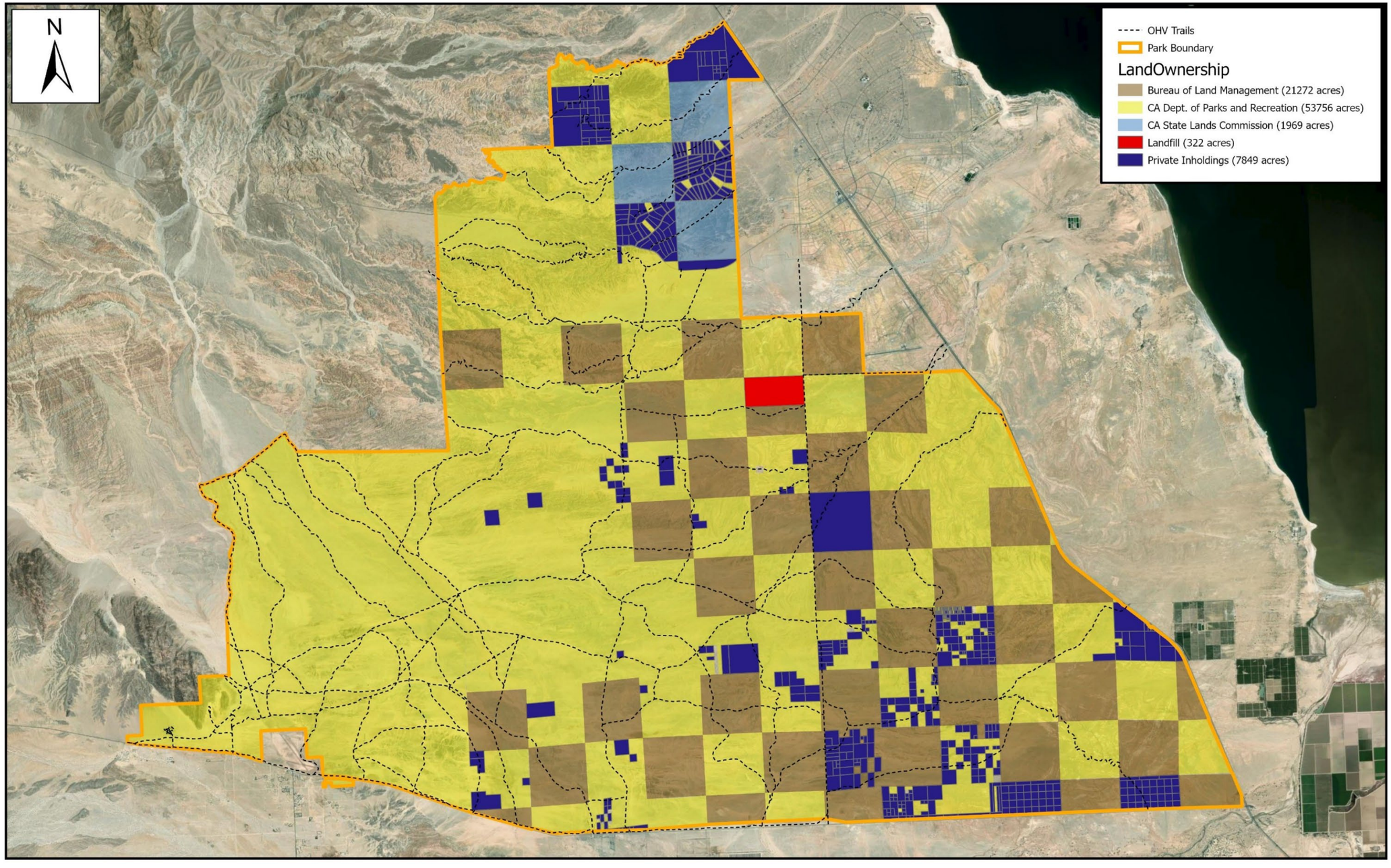


Figure 4. Property ownership within Ocotillo Wells SVRA.

2.1.1.1 Geothermal Development

Geothermal development of lands within the Imperial Valley, including those within Ocotillo Wells SVRA, has been of interest for many years. In 2008, a Record of Decision (ROD) was issued by BLM to allow for geothermal exploration and development within the Truckhaven Geothermal Leasing Area, much of which is contained within Ocotillo Wells SVRA. Existing geothermal wells include one in the eastern area of the park, and two geothermal exploration wells in the northern portion of Ocotillo Wells SVRA as part of the Truckhaven Geothermal Leasing Area (BLM 2007). In 2015, Orni-5, LLC. began a permitting process for up to ten geothermal exploration wells along County Dump Road. In 2021, subsurface geophysical data was collected to gather more information regarding geothermal resource development viability and assist in determining the best locations and directions to drill exploration wells. From this, two exploratory wells were installed in 2023, and at least two additional wells are anticipated in 2024. Exploration and testing of geothermal wells are ongoing and anticipated to continue in Ocotillo Wells SVRA.

2.1.1.2 Airports

Just outside of the park boundary are two airports, Ocotillo Airport and Salton Sea Airport (Figure 5). Ocotillo Airport is a local landmark managed by the County of San Diego Department of Public Works, Airport Administration. The airport is located on Benson Dry Lake on the northside of SR-78, directly next to Ocotillo Wells SVRA on three sides. The airstrip is used for U.S. military training, and by small planes, sailplanes, and motorized hang gliders (California State Parks, 2016). The Salton Sea Airport is a privately owned airport open to public use located just south of Salton City and across SR-86 on the west, directly next to the park boundary on two sides.

2.1.1.3 Local Communities

Adjacent to Ocotillo Wells SVRA are the small communities of Ocotillo Wells in San Diego County, and Salton City, in Imperial County (Figure 5). Both communities are sparsely developed and have limited variety of visitor services, housing, and commercial development. Borrego Springs is approximately 15 miles northwest of Ocotillo Wells SVRA from the western boundary and has more substantial development and visitor services.

2.1.1.1 Anza-Borrego Desert State Park®

Anza-Borrego Desert State Park® (ABDSP®) shares a boundary with Ocotillo Wells SVRA on the western and northern boundary of Ocotillo Wells SVRA and is managed by California State Parks. ABDSP® includes two State Wildernesses and 13 Wilderness Management Areas. The park contains several developed campgrounds and day-use areas, and primitive or backcountry camping opportunities. ABDSP® provides nonmotorized recreation opportunities and allows

highway-licensed vehicles to operate on established roads and trails. Both parks share goals to manage the boundary between the two parks.

2.1.1.1 San Felipe Creek Ecological Reserve

South of SR-78 there is a mix of BLM, CDFW, and private owned land (Figure 5). Of the CDFW own property, 1,900 acres of the land was designated as an ecological reserve by the Fish and Game Commission in 1994. This reserve provides a corridor of unique and highly valuable habitat. Habitat types include marsh, creosote bush scrub, mesquite woodland, mesquite dune, alkali sink scrub, and wash community (California Department of Fish and Wildlife, 2022).

2.1.1.1 Torres-Martinez Reservation

The Torres-Martinez Reservation was established in May 15, 1876 and is located in the lower Coachella Valley just north of ABDSP® (Figure 5). The reservation encompasses a total of 24,024 acres, half of which is submerged below the Salton Sea (Torres Martinez Desert Cahuilla Indians, n.d.).

2.1.1.1 Military Activity

A U.S. Navy base is located south of SR-78 and west of SR-86 about three and a half miles from the southern border of Ocotillo Wells SVRA (Figure 5). Military flights often travel through the airspace above the park. Additionally, many practice flights occur at Ocotillo Airport just outside of the park boundary.

A military remedial investigation is currently in the planning process prior to field investigation. This investigation aims to characterize the site conditions for bombing targets in association with World War II training to define the nature and extent of munitions and explosives of concern and munitions constituents' contamination and assess the risk to human health and the environment. The project will be looking at two bombing targets from the early 1940s for military practice. One target is in ABDSP® while another is split between the boundary of ABDSP® and OWSVRA.

2.1.1.2 Salton Sea

From the eastern park boundary, Ocotillo Wells SVRA is about 2.5 to 5 miles from the western edge of the Salton Sea (Figure 5). Surface drainage from the park generally flows into the Salton Sea. Typically, water flows through washes within the park after large weather events that occur either within the park or the nearby mountains. Flooding activities generally begin outside of the park and flow into the park through wash channels and ultimately into the Salton Sea.

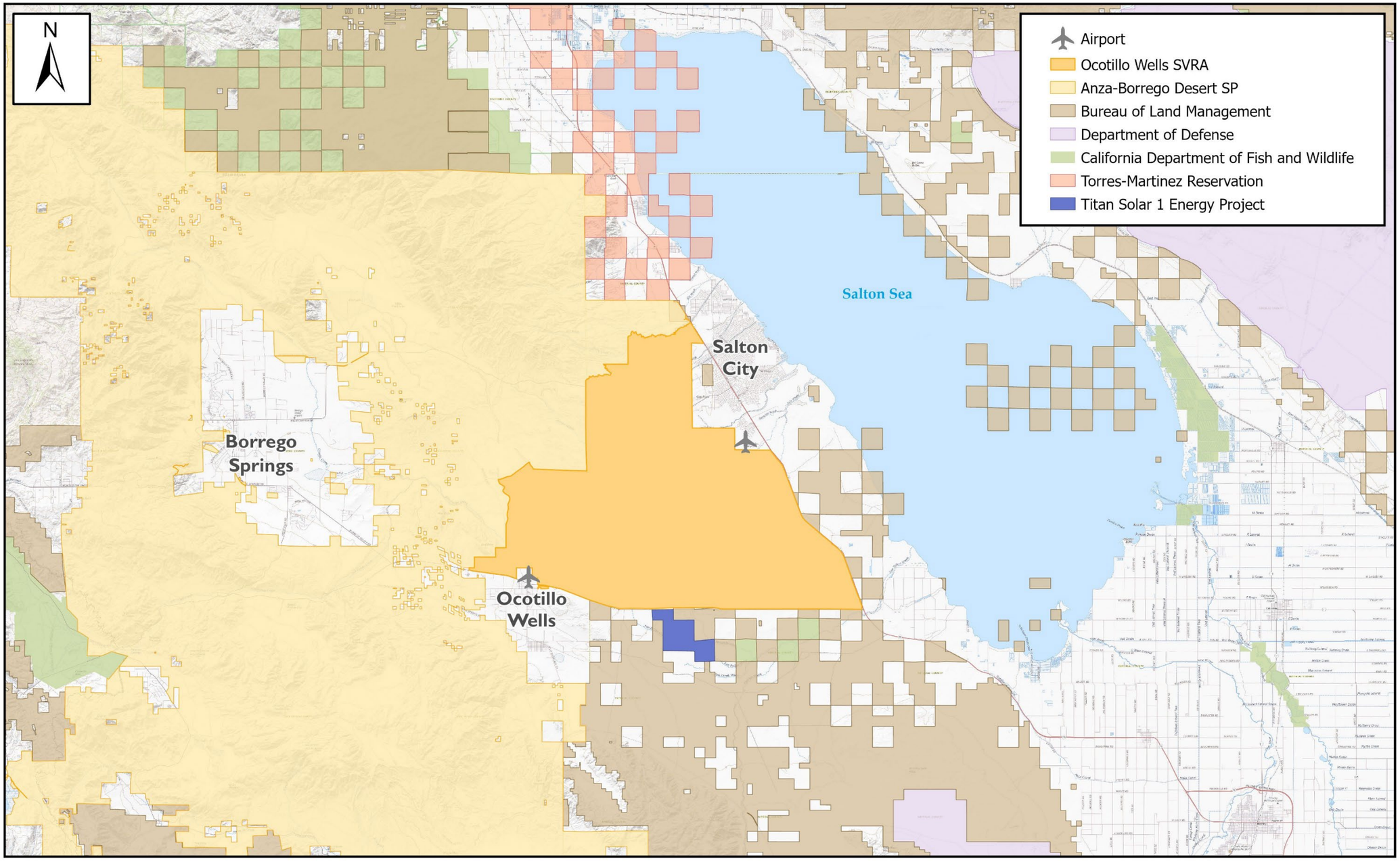


Figure 5. Regional land around Ocotillo Wells SVRA.

2.1.1.3 Additional Land Uses

A solar farm, the Titan Solar 1 Energy Project by Sunpin Solar is located just south of SR-78 (Figure 5). The project area is about 569-acres just west of BLM trail 191 and east of the Ocotillo RV Resort in Imperial Valley. Additionally, about eight miles south of OWSVRA, the U.S. Gypsum Mine is located at the south end of Split Mountain Road.

2.2 SITE DESCRIPTION

The majority of OWSVRA is relatively flat with a few areas of relief. Elevation typically ranges from about 175 feet below sea level to 950 feet above sea level. Seven broad, flat washes and many smaller arroyos, originating in ABDSP® in the north and west, cross through OWSVRA. When flowing, these washes generally drain easterly, toward the Salton Sea (Figure 6). They flow during large rain events and are occasionally subject to flash flooding.

Ocotillo Wells is largely undeveloped with limited infrastructure and improvements with a large network of trails through the park. The District Office area or headquarters is the most developed area located in the southwest portion of the SVRA including office buildings, housing facilities, Discovery Center, visitor restroom and shower facility, and dirt track for young OHV riders. Facilities are in areas where people often congregate or frequent. CXT restrooms are generally placed in key intersections, campgrounds, or at popular features for OHV recreation. The SVRA has five campgrounds that can be found at Main Street, Quarry, Holmes Camp, Hidden Valley Camp, Holly Road, and Crossover Camp.

There are a few areas within the park with specific use such as concentrated use and staging areas. Concentrated use areas are locations where concentrated OHV recreation is allowed only within designated areas and usually associated with unique terrain, group activity areas, or popular destination points (California State Parks, 2016). There are currently four concentrated use areas located at Blowsand Hill, Mat Puy Nah Achhuukaayp (formerly Devil's Slide), Shell Reef, and the 4x4 obstacle and Crossover areas. Staging areas provide a standard location for camping and activities that occur as part of the special event.

2.3 ACQUISITION

OHV use has occurred on OWSVRA, at least informally, since the 1930s. Substantial recreational OHV use began after World War II as surplus military jeeps and dune buggies became available to the public. Prior to the creation of the SVRA, OHV use in the area primarily occurred on private or state lands, located within ABDSP®, with limited direct management. In 1976, the California State Parks OHMVRD Commission classified a total of 14,600 acres as Ocotillo Wells SVRA (DPR, 1981).

Subsequently, DPR made additional acquisitions made to the east of the original SVRA's boundary. This area was about 52,000 acres, primarily a mixture of BLM, SLC, and private lands.

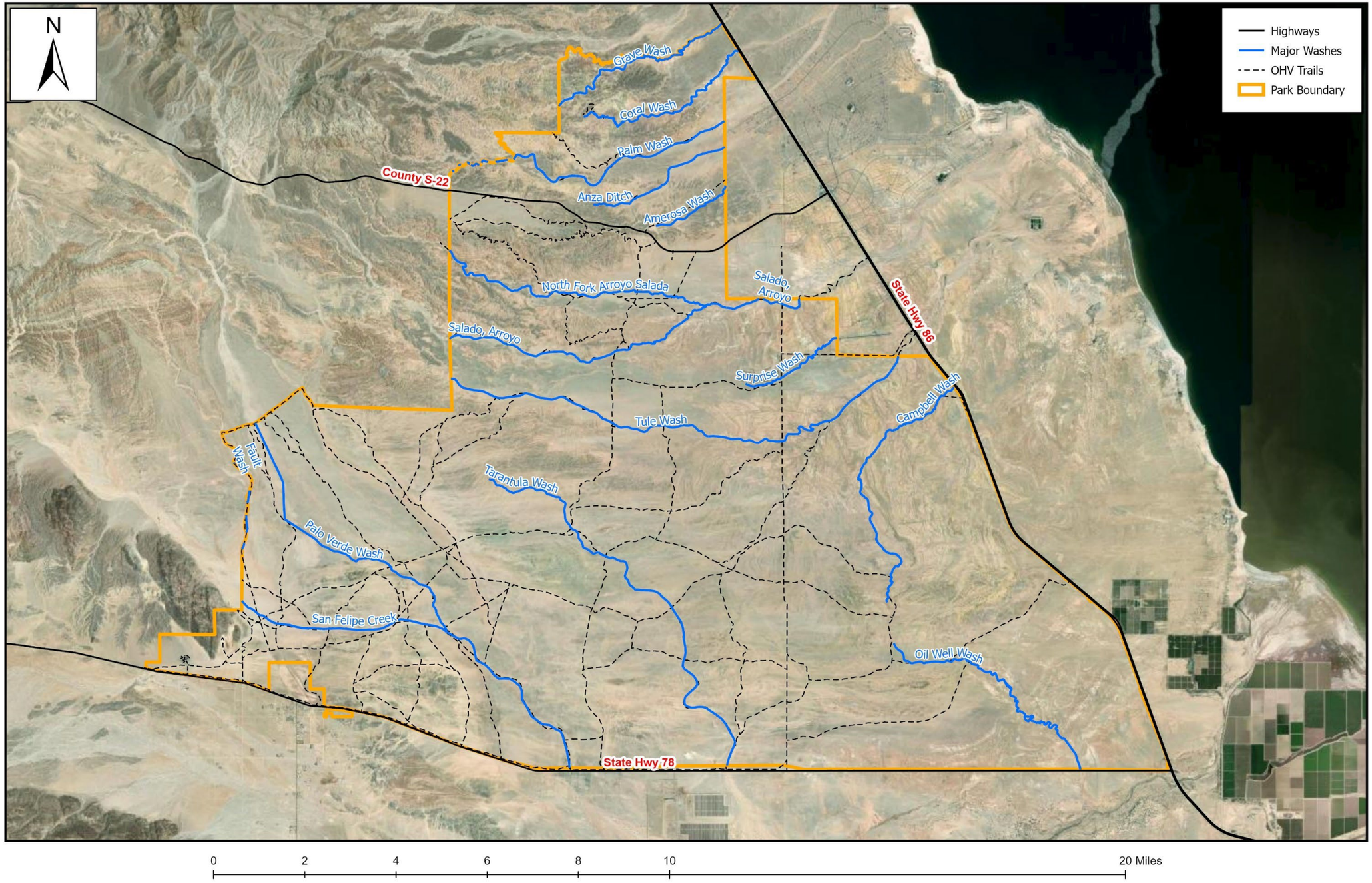


Figure 6. Major washes found in Ocotillo Wells SVRA.

The acquisition occurred in two phases. The first phase, in 1986, extended from the San Diego – Imperial County line east to Poleline Road, totaling 28,300 acres. The second phase extended from Poleline Road east to Highway 86, totaling 23,700 acres. This acquisition was completed in the early 2000s. In 2010, Truckhaven, about 7,800 acres, was transferred to OWSVRA. This area is near Salton City, west of Highway 86, and north of S-22. The land was previously owned by a mixture of public and private entities with little or no on-the-ground management activities.

Land acquisition continues to occur at a smaller scale opportunistically. Over the years, several inholdings have been added to the SVRA. During the Truckhaven acquisition, the surveyed areas included land currently not owned by DPR in the event future acquisitions may occur. In the future, BLM lands may potentially be transferred to Parks as part of the previously discussed land transfer.

2.4 VISITATION

OWSVRA is open seven days a week, 24 hours a day. Open camping is available anywhere throughout the SVRA, except for a few prohibited areas, for up to 30 days per calendar year. The majority of visitation occurs during the winter months (November to March) when the desert temperature is temperate. Traditionally, Halloween weekend marks the start of the OHV riding season at OWSVRA, and it extends until early spring, around Easter. The cooler winter climate makes this time ideal for a high-quality recreational experience. During peak visitation events, the SVRA can experience over 35,000 daily visitors.

2.4.1 Access into the SVRA

2.4.1.1 State Route 78

Most visitors travel to OWSVRA from the greater San Diego area via SR-78. The most accessible entrance point for these visitors is Ranger Station Road in the southwest portion of the SVRA. There are multiple additional entrances into the SVRA that are stop sign controlled along SR-78. The entrances are not specifically marked; rather small side streets that lead into the recreational area are located at Main Street, Wolfe Well Road, Ocotillo Road, County Line Road, Cooksy Trail, Cahuilla Trail, and Poleline Road.

Poleline Road provides relatively easy access to the interior of the SVRA. Some trails begin or end at SR-78 and can be accessed at any point along the highway. SR-78 has open shoulders that lead into OWSVRA allowing entrance and exit at the discretion of the visitors. Users of the SVRA tend to utilize trails to exit the park rather than other locations.

2.4.1.2 State Route 86

SR-86 forms the eastern boundary of the SVRA and junctions with the Borrego Salton Seaway (S-22) southwest of Salton City. Due to this, SR-86 is a popular access point for locations in the

SVRA north and south of S-22. The entrances are not specifically marked, but turnouts lead into the SVRA. Each entrance point is stop sign controlled and most can be accessed travelling both southbound and northbound on SR-86. The northmost part of the park, Truckhaven, can be accessed off SR-86 north of S-22.

2.4.1.3 Borrego Salton Seaway

S-22 is a paved road in the northern section of the SVRA that is maintained by both Imperial and San Diego Counties, with the section of road adjacent to the SVRA maintained by Imperial County. It provides relatively easy access into the park. Most visitors accessing the SVRA from this road use Holly Road, 4x4, and Crossover trail entry points. S-22 is also an access point to enter into Truckhaven.

2.5 HISTORICAL LAND USE

Ocotillo Wells SVRA and the surrounding area was a shared space for multiple Native American tribes including the Kumeyaay (Ipai-Tipai), Cahuilla, Quechan, and Cocopah. There are no known permanent villages within the boundaries of the park, however there were many seasonal camps (Bean, 1974). The presence or absence of a freshwater lake, ancient Lake Cahuilla, determined the tribes' use of the land.

When the ancient Lake Cahuilla was present, tribes would hunt for fish and other fauna, and utilize the plants found along its banks. Fish would be caught using stone structures along the shoreline known as fish traps. Generally, one or two stone courses tall, the fish traps were J or V shaped with one arm being shorter than the other. The apex of where the two arms met was set within the water, with the arms extending toward the shore. The large arm extended onto the shore, with the smaller arm set in the water allowing for fish to swim between it and the shore into the V shape (White & Roth, 2003). A basket with bait was placed at the apex of the trap to entice fish into entering through the side of the smaller arm and into the basket.

When the lake was dry, this area was mainly visited in the cooler months to gather items for seasonal storage. A wide variety of animals and plants were available including mice, rabbits, kangaroo rats, ground squirrels, arrow weed, California fan palm, creosote, desert willow, an abundance of annual plants, and mesquite (Bean & Saubel, 1972). Mesquite was an important multiuse food source in the desert with its edible blossoms, seed pods, and beans. The beans could be eaten directly, or ground into a flour and mixed with water to make small storable cakes. They could later be rehydrated as a porridge or eaten dry (Bean, 1974).

In the late 1800s to early 1900s, cattlemen and gold miners settled into the Imperial Valley region including the nearby Borrego Valley area. Two primary routes crossed the area, Kane Springs Road leading to Brawley and Truckhaven Trail to Highway 99, currently Highway 86, in the 1920s and 1930s. Truckhaven Trail was a road created by Borrego homesteaders from

Borrego Valley across the northern edge of the Borrego Badlands to connect near a gas station called Truckhaven.

In the late 1800s, the demand for crude oil as a fuel in North America and around the world quickly grew and oil became the new gold of the era. By 1901, an oil expert had declared the Salton Basin area "the best and largest oil area in the world." During the early 1900s, the promise of oil drew prospectors to the area and, by 1905, drilling for oil had started in the Carrizo Creek region, south of the park (Fitzpatrick, 2011).

In the 1930s and 1940s, prospectors began searching for oil within the park boundaries after the prediction and promise of huge quantities of oil under the Salton Sink. Little, if any, resource was found (Fitzpatrick, 2011). Although there were many attempts to find oil, none came into fruition. When the era of oil exploration in the Ocotillo Wells area ended between 1919 and 1982, attempted oil drilling was abandoned and wells were shut down due to lack of oil, or poor oil quality.

In the 1920s, soldiers returning from World War I with lung issues were encouraged to regain their health in the deserts of California and several homesteads were set up within Ocotillo Wells area (Parker, 2011). During the Great Depression (1929–1939) the San Felipe Oil Company built an access road to their well, creating the first service road into the area of the present-day Ocotillo Wells SVRA. The service road is still used today and is known as "Wolfe Well Road" (Fitzpatrick, 2011). The Standard Oil Company of California used their poor-quality oil to construct a service road to their drilling site in 1944, called the Oil Well Tarmac Road. The overall search for oil within the OWSVRA boundary was unsuccessful and left behind abandoned wells and a few roads still currently used today.

During World War II, Ocotillo Wells area was used by the U.S. Army as a training and maneuver area for troop training. Known as the Borrego Maneuver Area, it was used for vehicle training, bomb and gunnery practice, and troop maneuvers, and included military facilities to support these activities. Military use ended in 1944. Many roads and trails associated with both oil and military activities are still utilized within the SVRA today. For example, Veterans Pass is a trail within Ocotillo Wells SVRA that partially follows Military Dump Road (MDR), a historic era trail. The trail is associated with the WWII rocket target areas Winona I and II.

Since the 1930s, OHV use has occurred, at least informally, on what is now OWSVRA. Recreational OHV use began after World War II with surplus military jeeps and dune buggies. In April 1976, the area was classified as a SVRA (DPR, 1981). No formalized trails existed on the property in the 1980s. The open terrain of the SVRA was attractive to OHV enthusiasts for desert travel and exploring. The land in the early SVRA boundary was mostly used for unrestricted cross-country travel, usually along natural sand washes. Other trails were developed along old military and exploration roads (DPR, 1981). Some trails developed to travel between points of interest.

Barrel Springs is a natural water source that has played a vital part for both wildlife and humans. This natural water source has helped provide an ample habitat of mesquite dunes for wildlife. This water source was utilized by Native tribes and later workers and travelers (Kress, et al, 2011). Archaeological work conducted at Barrel Springs in the 1970s revealed it was seasonally used for harvesting and hunting between 1500 AD and 1816 AD. It received its name historically from miners prospecting at the Three Buttes Mine around 1912. Attempting to develop a water supply they found a patch of damp sand, dug, and placed a barrel in a shallow hole, and it filled enough to gather water (Reed, 1986). Due to the cultural significance and restoration purposes of the mesquite dunes, a fence was put in place around the spring by the park in 1986 and the area was established as the Barrel Springs Cultural Preserve. Since then, the fence has been expanded to continue the protection for cultural and native restoration purposes.

2.6 Project Area Characteristics

2.6.1 Geology

2.6.1.1 Soils

OWSVRA contains four main types of soils within its boundaries, Badland-Beeline-Rillito, Rositas-Carrizo-Orita, Meloland-Vint-Indio, and Gilman-Indio-Coachella soils. Badland-Beeline-Rillito dominate the majority of the park, 60,613 acres, particularly in the northern and eastern portions. Rositas-Carrizo-Orita soils are found in 18,799 acres in the western and southwestern portions of the SVRA, Meloland-Vint-Indio in 4,637 acres in the southern and southeastern portions of the SVRA, and Gilman-Indio-Coachella in 815 acres in the far northeast portion of the SVRA (Figure 7). All soil types are generally sandy, well-draining, loose material, and do not consolidate well. If wetted the soils can become clay or mud like depending on the clay content in the area.

Badland-Beeline-Rillito soils are typically associated with hilly and rock outcrop areas throughout the SVRA. This soil type is formed on moderately sloping to steep dissected drainages and in mixed alluvium (USDA, 1973). Badland soils encompass the central part of the SVRA containing the mud hills, consist of barren, eroded soft shale or sandstone broken by numerous gullies.

Rositas soils are generally excessively drained, coarse sands occurring in alluvial fan areas of the SVRA. The Rositas-Carrizo-Orita association soils typically form on alluvial fans, terraces, and basins (BLM 2007).

Meloland-Vint-Indio soils are typically formed on nearly level land and are well-drained fine sand to silt loam. The soil erosion hazard on these soils is generally slight, but soils in this unit are susceptible to blowing and to erosion during infrequent periods of intense rainfall. Natural

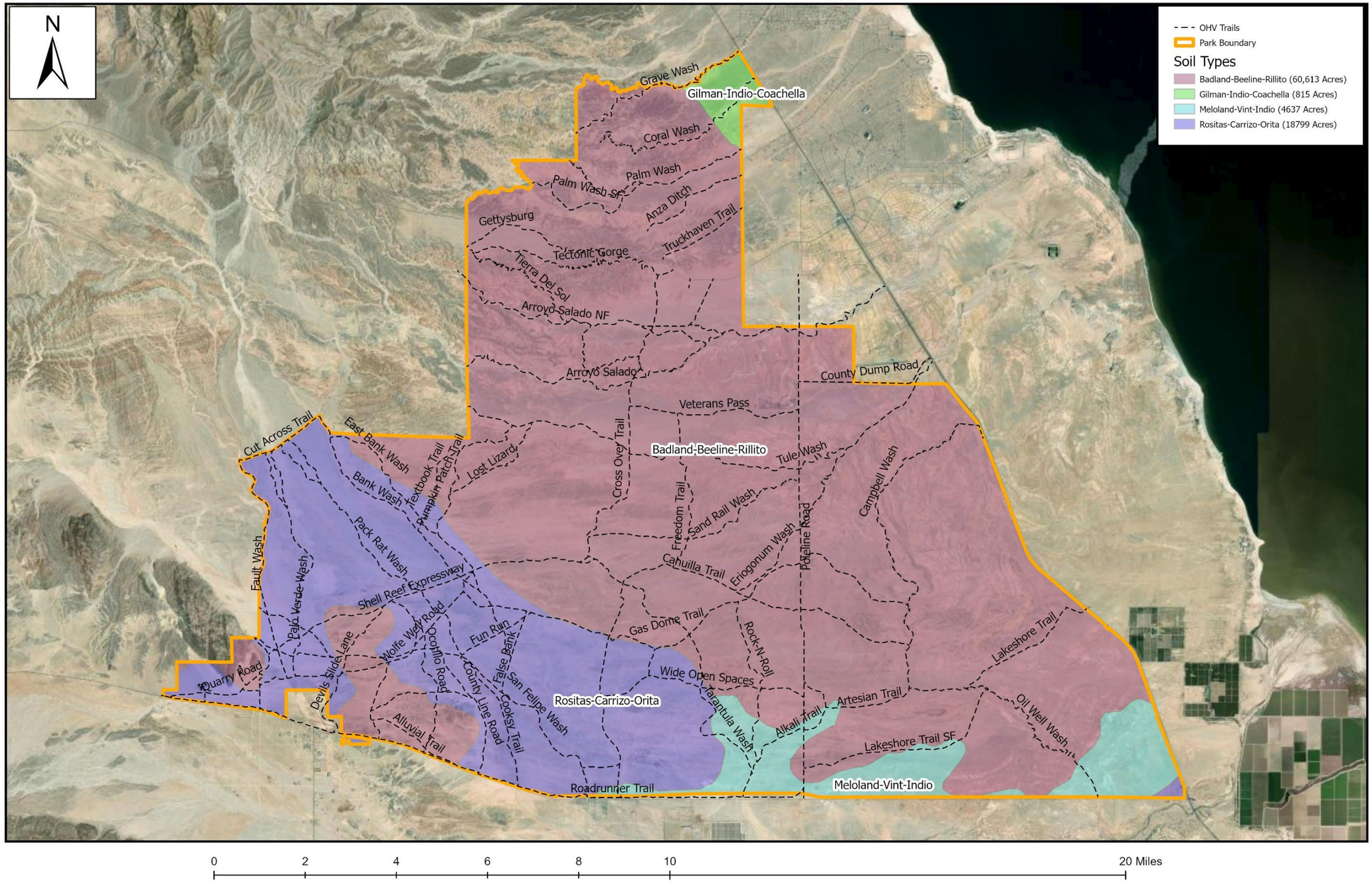


Figure 7. Soil types found within Ocotillo Wells SVRA.

drainage patterns of these types of soils are very susceptible to modification by the seepage of water from irrigation canals and by extensive irrigation (USDA, 1973).

2.6.1.2 2012 Study of the Geology and Soils

At the request of DPR OHMVRD, the California Geological Survey (CGS) compiled a 1:24,000 scale geological map of OWSVRA as a basis for understanding the underlying geology and soils within the SVRA and to assist with general planning issues on a regional scale. Soil samples were used in analyzing grain size variations and in refining the boundaries of the variations and the various geologic units. The study found that OWSVRA contains numerous Quaternary surficial deposits (less than 2.6 million years) on alluvial fans and floodplains. In general, areas of most recent deposition during Late Holocene time (within the last 500 years) have a greater potential to be areas of future flooding and deposition than those areas where older surficial deposits are exposed. Additional information can be found in Appendix 1.

2.6.1.3 Faults

The Imperial Valley and OWSVRA are bordered on the west and southwest by low-lying mountains comprised of deformed marine and non-marine sediments interspersed with 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. The faults in the area include the Imperial fault, the San Andreas fault, and the San Jacinto fault (Figure 8). 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 which crosses the southwest corner of OWSVRA (Borrego Mountain sections including the Coyote Creek fault), 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.

2.6.1.4 Paleontological Resources

Paleontological resources have been documented within Ocotillo Wells SVRA. These fossil remains represent a variety of taxonomic groups including marine benthic invertebrates, freshwater benthic invertebrates, freshwater invertebrates, terrestrial plants, and terrestrial vertebrates (Deméré, 2012). Potential fossil-bearing formations are widespread within Ocotillo Wells SVRA.

2.6.2 Climate/ Weather

OWSVRA has a hot, dry desert climate and is in the rain shadow of the Santa Rosa Mountains of the Peninsular Range. Average annual rainfall is 3.5 inches. There is considerable daily range in

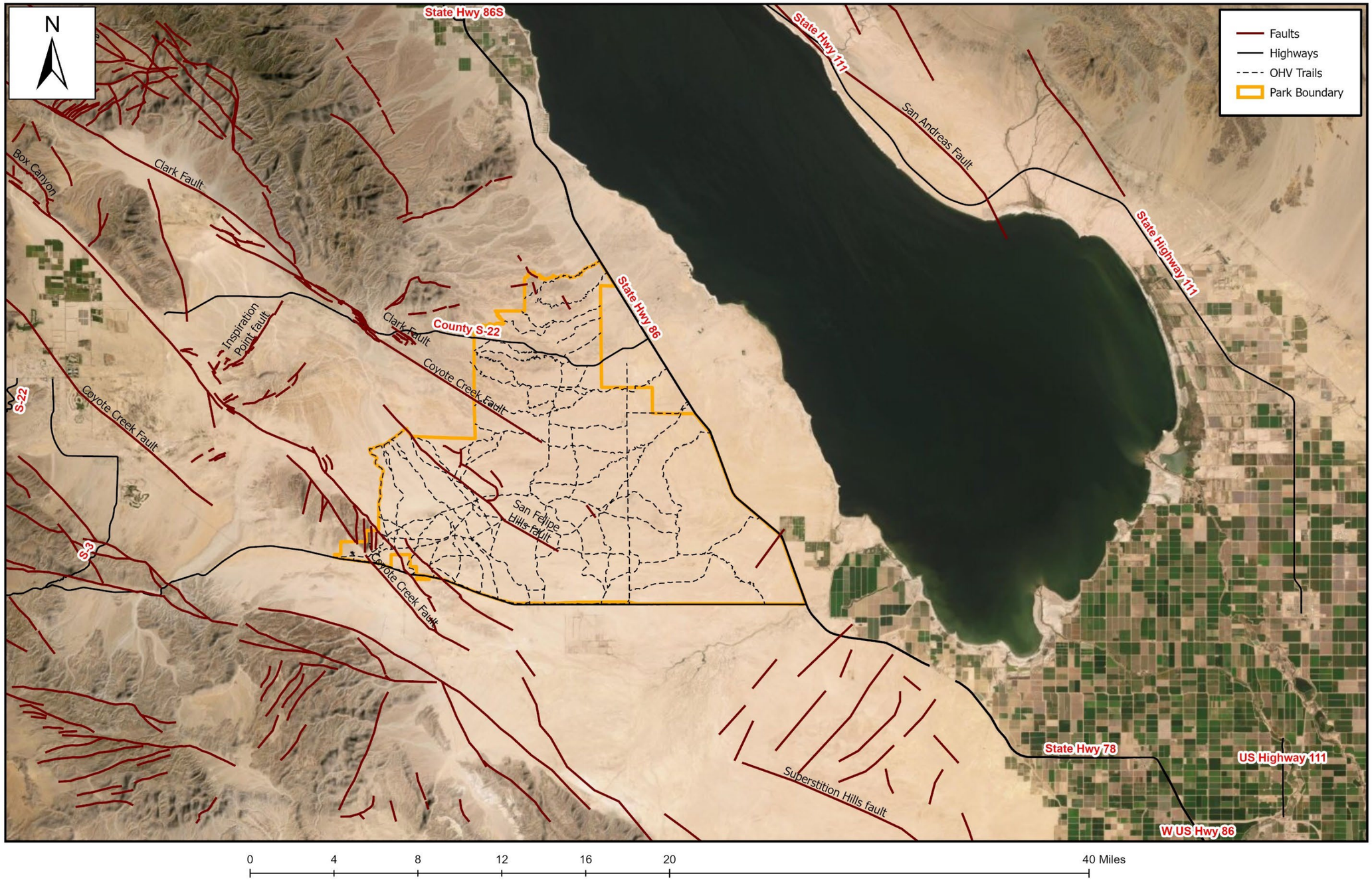


Figure 8. Faults found within and around Ocotillo Wells SVRA.

temperatures, with summer ranging from 70 to 120 degrees Fahrenheit (°F) and winter ranging from about freezing (32°F) to 70°F (California State Parks, 2016). Dry and warm easterly winds, known as the "Santa Ana winds," occur primarily in the fall and winter while westerly winds occur primarily in the spring and fall. These winds may reach velocities of 50 miles per hour and can produce regional dust storms in the desert setting.

2.6.2.1 Imperial County

A large portion of Ocotillo Wells SVRA is located in the northwest corner of Imperial County. All of Imperial County is contained within the Salton Sea Air Basin (SSAB) (Figure 9). The climate is typical of a desert with low annual precipitation (2.61 inches annual average, most of which is received 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. In the summer, the Pacific High is located well to the north, 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 limits precipitation in Imperial County.

2.6.2.2 San Diego County

The most western portion of Ocotillo Wells SVRA is in the northeast corner of San Diego County which is contiguous with the boundaries of the San Diego Air Basin (SDAB) (Figure 9). The county has a diverse region with three distinctive geographic areas including low-lying coastal plain, the mountainous peninsular range, and the desert Salton (Imperial) Basin, allowing for a variety of climates. Climate types typically range from semi-arid (Mediterranean) to arid (desert) climates (Department of Planning and Land Use, 2011).

Generally, the climate in the SDAB is dominated by a semi-permanent high-pressure cell located over the Pacific Ocean. These cells influence the direction of the prevailing winds (westerly to northwesterly) and maintains clear skies for most of the year. Within the desert region of the SDAB, the climate consists of very hot, dry summers, occasional late summer rainfall, and cool to cold winters with relatively low rainfall. Heavy rainfall events are usually associated with summer thunderstorms or monsoon season. These events can cause flash floods in dry wash channels (Department of Planning and Land Use, 2011).

2.6.3 Air Quality

Imperial Counties and San Diego both have Air Pollution Control Districts (APCD) that are responsible for protecting the public health and welfare in their respective counties through

administrating federal and state air quality laws and policies. Included in ICAPCD's and San Diego Air Pollution Control District's (SDAPCD) tasks are monitoring air pollution, preparing the Imperial County and San Diego portion of the State Implementation Plan (SIP) respectively, and promulgating its rules and regulations. The SIP includes strategies and tactics to be used to attain and maintain acceptable air quality.

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. The purpose of these designations is 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 on the basis of 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/m3) 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, 2018). If an area is redesignated from nonattainment to attainment, the federal Clean Air Act requires a revision to the SIP, called a maintenance plan, to demonstrate how the air quality standard will be maintained for 10 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.

The SDAB has been designated by federal EPA standards as a nonattainment area for the 8-hour ozone standard and as unclassified for PM_{10}. Under the state, the SDAB has been designated as nonattainment for PM_{10} and particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less ($PM_{2.5}$). However, SDAPCD has not identified Best Available Control Measures specific to OHV use.

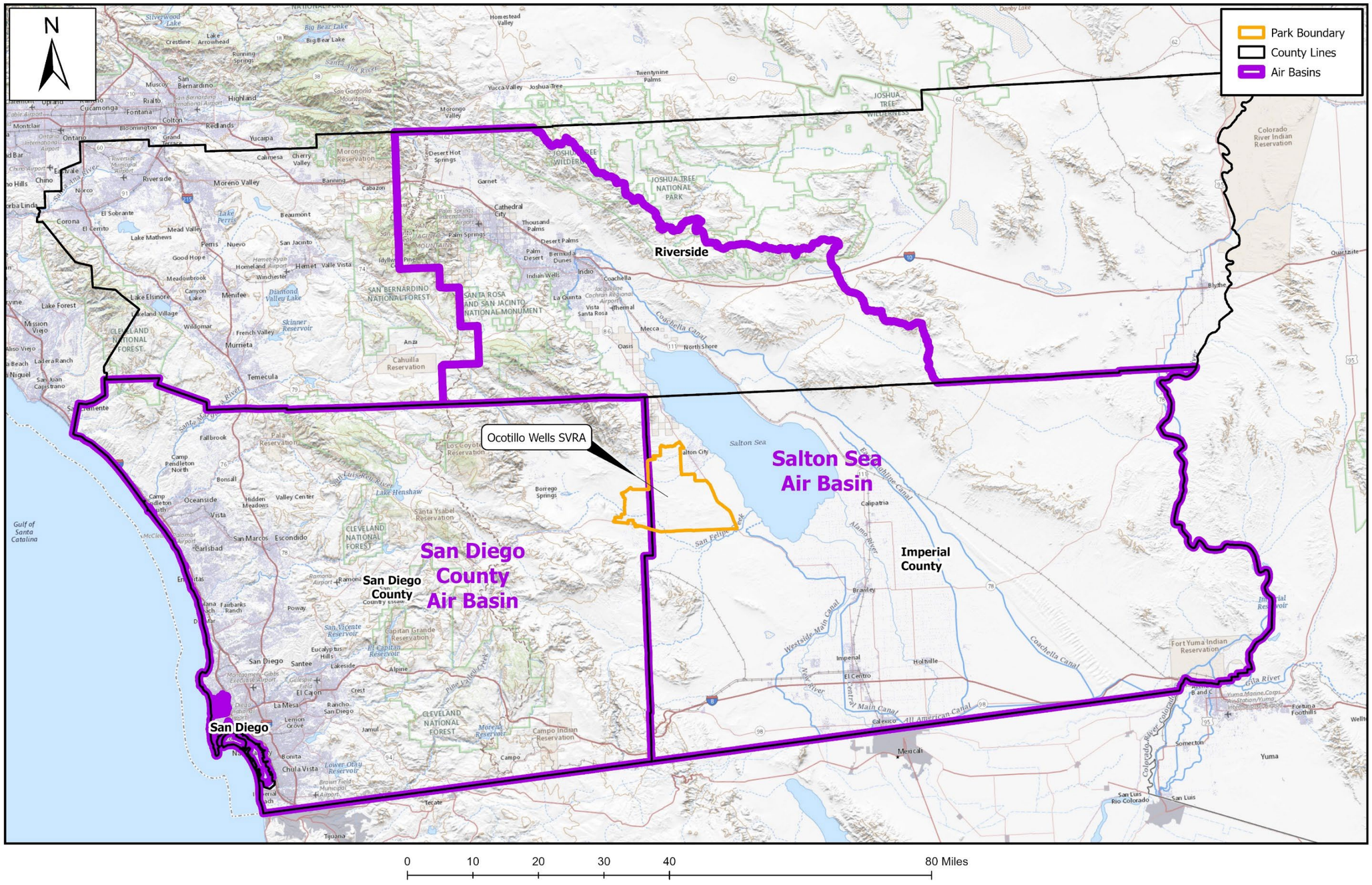


Figure 9. Salton Sea and San Diego County Air Basin in relation to Ocotillo Wells SVRA.

2.6.4 Hydrology

Ocotillo Wells SVRA is within the Colorado River Basin, which contains portions of Mexico, California, Arizona, New Mexico, Utah, Colorado, and Wyoming. Despite its dry climate, this region contains two water bodies of state and national significance: the Colorado River and the Salton Sea.

The Salton Sea Transboundary Watershed is divided into several Hydrologic Units, many of which are divided into Hydrologic Areas. The northern half of Ocotillo Wells SVRA is located within the West Salton Hydrologic Unit and drains generally northeastward to the Salton Sea. The southern half of Ocotillo Wells SVRA is located within the Lower San Felipe Hydrologic Area of the Anza Borrego Hydrologic Unit, which generally drains south and east through Tarantula Wash and San Felipe Creek, ultimately to the Salton Sea.

The major washes that cross Ocotillo Wells SVRA are Palo Verde Wash, Arroyo Salado, Surprise Wash, Tule Wash, Tarantula Wash, and San Felipe Creek. San Felipe Creek is the largest of the washes and drainages in the SVRA and carries runoff from most of ABDSP®. These drainages are subject to flash floods during significant precipitation events.

A draft trail condition survey report from 2006 and 2007 identified old subdivisions, military, mining or oil and gas roads, and associated features (ditches, dikes, levees, berms, and the like) scattered throughout the park (DPR, 2007). These features were created before the SVRA was established and designed for the most efficient traffic routing from one point to another or possibly following parcel or section boundaries. When surface water flows occur in these areas, the features act as water diverters and start a system of concentrated flows.

2.6.4.1 Ancient Lake Cahuilla and Salton Sea

OWSVRA is in the western portion of Imperial Valley, which is part of the Salton Trough, a structural and topographic depression that lies 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 the late 17th century, Lake Cahuilla dried up for the last time (Laylander, 1995). One of the remnant shorelines of Lake Cahuilla, mapped within the SVRA by Redlands Institute 2000, is about 40 feet above sea level. Over 80 miles of the shoreline can be found within the park.

Due to the intermediate filling and receding of Lake Cahuilla, soil in the area was desirable as agricultural land. Interest in agricultural uses of this land began in 1855, most strongly by The California Development Company. In 1900, canals to irrigate the land were constructed and in 1901 the Imperial Land Company (incorporated by the then president of the California Development Company) began to lay out town sites in the newly dubbed Imperial Valley. By

1902, 400 miles of irrigation ditches and water were available for 100,000 acres of arid desert. Between 1904 and 1906, the Colorado River once again moved towards the west and heavy rains fell almost unhampered into the Salton Sink. Rock dams and levees were put into the place and eventually pushed the Colorado River into its previous channel in February 1907 (Kennan, 1917). As a result of this large flooding event, the Salton Sea was created. The Salton Sea currently sits 227 feet below sea level and between two to five miles to the east of the Ocotillo Wells SVRA.

For a time, the Salton Sea was sustained primarily by agricultural runoff that drained into the Sea and it became an important habitat for migrating birds along the Pacific Flyway. This runoff was highly saline and increased the salinity of the Salton Sea beyond sustainable levels for most fish. However, the water levels in the Sea have decreased since a large-scale water transfer agreement, the 2003 Quantification Settlement, was implemented and more efficient agricultural production techniques have been employed. As the Sea recedes, there are regional concerns about air quality as the newly exposed shoreline, referred to as playa, is exposed to high winds and arid conditions that may cause it to become airborne. There are also concerns about the loss of wildlife habitat, particularly for migrating birds. In 2017, the state released a ten-year plan, the Salton Sea Management Plan (SSMP) to guide state projects, particularly focused on air quality and wildlife habitat, at the Salton Sea and address potential public health and environmental effects for the next decade (Taylor, 2018). The California Department of Water Resources is currently developing a long-term management plan looking beyond the initial ten-year SSMP.

2.6.4.2 Water Sources

Several natural water sources are located within the park. These locations often have standing water or are wet on the surface year-round, providing wildlife a source of water during the summer. Most seeps, such as Arroyo Salado, Salt Dome, Tectonic, Tule, and Tule Spur are in washes. These water sources are often protected from OHV activity by barricades, allowing OHV activity within the wash but not within the water source. A few seeps outside of washes are fenced, like Barrel Springs and Gas Domes. Water sources like these can also have ties to cultural resources.

2.6.4.3 Wells

OWSRA maintains three wells within the park. These wells are located at the District Headquarters, Holmes Camp, and Toner Property. In addition to these park wells, there is a history of oil and geothermal exploration within the SVRA, and many historic capped wells are present. At Artesian Well, the U.S. government capped the well in 1935 and added a small pipe that creates a small stream flow every few minutes. Some historic wells have been fenced, although most still allow public access.

2.6.5 Geothermal

Geothermal development of lands within the Imperial Valley, including those within Ocotillo Wells SVRA, has been of interest for many years. The first attempt at commercial development of geothermal resources in the Imperial Valley began in the late 1920s, with successful developments occurring in the 1950s. In 1982, the first geothermal exploration well was drilled along County Dump Road by Phillips Petroleum, in an area that has since been acquired by State Parks as part of the SVRA. A second well was drilled in the mid-2000s along Poleline Road. Both wells were drilled straight down using typical industry methods. Exploration results deemed that the area contained potentially viable geothermal resources, however for many years following these initial tests the area was not further developed. Advances in technology, greater interest in renewable energy development, and government leases in recent years have driven interest in continuing exploration and development of geothermal resources within the SVRA.

Through the Federal Land Policy and Management Act of 1976, Congress set aside 25 million acres of the southern California deserts as the California Desert Conservation Area (CDCA). In 2013, the Desert Renewable Energy Conservation Plan (DRECP) was enacted to better manage this large area. Public land uses were split into several categories to facilitate renewable energy and conservation goals and help to streamline the permitting process. Development Focus Areas (DFA) were set aside for streamlined access to solar, wind, and geothermal exploration and development, with designated conservation and recreation areas being largely excluded from development (California Energy Commission, 2022).

The Truckhaven Geothermal Leasing Area (TGLA) is one of the DFAs that is situated on land within the Ocotillo Wells SVRA. A Final Environmental Impact Statement (FEIS) for potential leasing of the area was produced by the BLM El Centro Field Office in October of 2007. Three options were weighed including not leasing any lands for geothermal energy development, only leasing resources with pending applications, or allowing all Federal geothermal resources to be leased. The FEIS determined that “the interests of the public would be best served by selecting Alternative III” or leasing all BLM-managed lands within the TGLA (BLM, 2007). The FEIS provides additional details on the typical development of wells, how the exploration is conducted, what kinds of facilities may be built, and what happens once the facility needs to be closed.

Upon completion of the FEIS, the BLM El Centro Field Office listed three potential geothermal development leases for competitive bidding within the TGLA. In general, the leases were for areas near County Dump Road, Gas Domes, and BLM land on the eastern portion of OWSVRA. At the conclusion of the bidding, only one lease was issued for the location near County Dump Road (referred to as the Truckhaven Geothermal Project area or “New Truckhaven”) to Orni-5, LLC. In 2015, the company began the permitting process for up to ten geothermal exploration wells along County Dump Road. Subsurface geophysical data was collected in 2021 to gather

more information regarding the geothermal resource development viability and assist in determining the best locations and directions to drill exploration wells.

SLC issued non-surface occupancy leases to Orni-5, LLC. to permit slant drilling of minerals under lands owned by DPR; no well construction or other facilities were permitted on the surface of DPR owned lands. Additional wells may be constructed on BLM property managed by OWSVRA through the MOU. Two exploratory wells were installed in 2023, and at least two additional wells are anticipated in 2024. If exploratory wells are successful, further development of facilities may occur to facilitate sales of the generated geothermal energy.

2.7 Management Units (MU)

Management units (MU) allow large sections of land to be subdivided into areas of comparable resources, topography, or use type, which makes larger landscapes more manageable. Delineation of OWSVRA MUs was conducted based on OHV travel designation (e.g., open ride vs. trails only), terrain differences (i.e., washes and floodplain), management focus (e.g., sensitive species), vegetation density, and other management considerations (i.e., land ownership, development pressure, and facility presence). There are eight total MUs: Headquarters, Catshead, Barrel Springs, Open, Northern Washes, 4x4 Area, East of Poleline, and Truckhaven. The following is a brief description of each MU (Table 1) and an overview map (Figure 10).

Table 1. Management Unit use, soil, and vegetation type.

MU Name	OHV Use Type (open or trails)	Soil Type	Dominant Vegetation Community
Headquarters	Open	Rositas-Carrizo-Orita	Creosote scrub
Catshead	Open	Rositas-Carrizo-Orita	Creosote scrub
Barrel Springs	Open	Rositas-Carrizo-Orita, Badland-Beeline-Rillito soils	Creosote scrub; mesquite hummocks
Open	Open	Rositas-Carrizo-Orita, Badland-Beeline-Rillito, and Meloland-Vint-Indio	Creosote scrub; saltbush/burrobush scrub
Northern Washes	Open	Badland-Beeline-Rillito	Creosote scrub; desert wash scrub; saltbush/burrobush scrub
4x4 Area	Open	Badland-Beeline-Rillito	Creosote scrub
East of Poleline	Trails	Badland-Beeline-Rillito, Meloland-Vint-Indio	Creosote scrub; saltbush/burrobush scrub
Truckhaven	Open	Badland-Beeline-Rillito, Gilman-Indio-Coachella	Creosote scrub

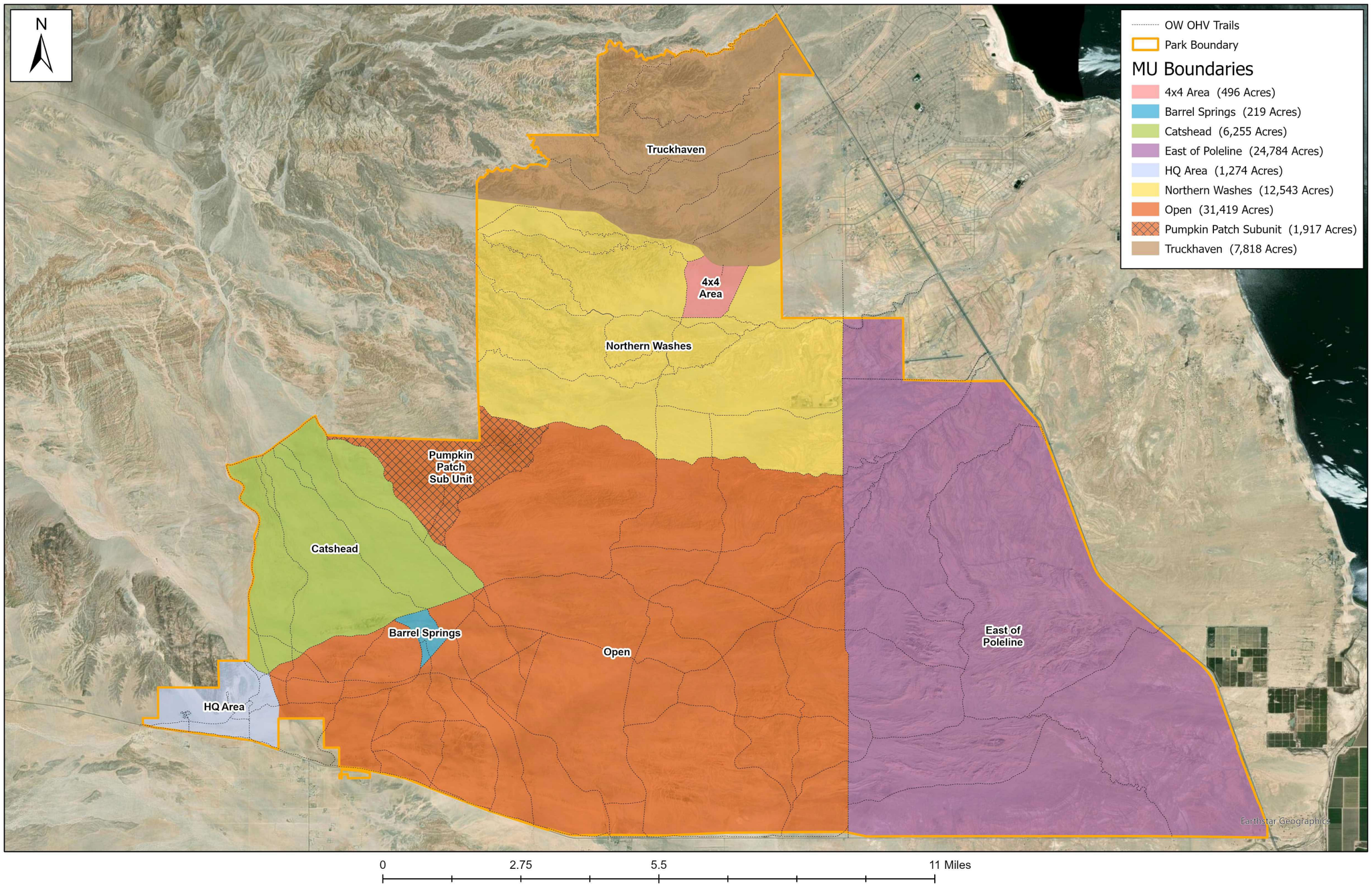


Figure 10. There are eight management units delineated in Ocotillo Wells SVRA.

2.7.1 Headquarters

The Headquarters MU is 1,274 acres and designated as open riding, with a few large areas fenced off to preserve natural resources and for a youth training track. The western extent of this MU is bordered by ABDSP®. This section of the park is one of the primary park entrances, containing popular camping areas and facilities. The District headquarters, as well as the park's Discovery Center, are located in this MU. Dispersed camping occurs within the MU; however, camping is often concentrated in specific designated camping areas and near facilities. No camping is allowed in the northeastern section of the MU. The riding activity is generally dispersed throughout the area with concentrated riding on the trails.

This MU is largely flat with an area of relief. The area of relief can be found north of Quarry Road where a butte mostly consisting of larger rocks or boulders can be found. On the southeastern side of this butte, a large sand dune known as Blowsand Hill can be found. To the east of Blowsand Hill, a smaller butte can be found, locally known as the Cove. This area is fenced off to protect the unique habitat type found here and to limit unauthorized access into ABDSP® as it is uncommon within the SVRA.

The soils found in this MU include Rositas-Carrizo-Orita and Badland-Beeline-Rillito. This area has a moderate potential for paleontological resources, however there are also areas of low and very low potential as well. This MU is primarily dominated by creosote scrub.

2.7.2 Catshead

The Catshead MU is 6,255 acres and currently designated as open riding, with the draft General Plan considering a trails only riding designation. The northern and western extent of this MU shares a border with ABDSP®. There are no designated camping areas or facilities within this MU. The area around Mat Puy Nah Achhuukaayp (formerly Devil's Slide), north of Shell Reef Expressway is designated as a no camping area. Riding activity is typically concentrated on trails with dispersed riding mostly concentrated in the southern section of the MU. A few small, fenced areas are present within this MU.

This MU is mainly flat with minimal or no areas of relief. Originating from ABDSP®, seven broad shallow washes flow through the MU in an overall northwest to southeast direction. This MU is subject to flash flooding during large weather events within the area. Due to the flat landscape, flash floods in this area are often shallow and wide. Large-scale flooding events in this area are usually not confined to a specific channel and can also alter channels within the washes.

Soils in the Catshead MU are primarily Rositas-Carrizo-Orita. Most of the MU has a low paleontological potential, but there are portions of moderate and high potential. This MU has the highest vegetation density within OWSVRA with creosote scrub as the dominant species.

Restoration efforts in this MU have occurred in prior years as this area has a higher density of vegetation, provides habitat for many species (e.g., flat-tailed horned lizard, LeConte's thrasher, burrowing owl), and may possibly become a trails only riding area in the future.

This area was a well-established training ground during World War II and there is a potential for historic munitions to be present. When flash floods move through this area, they have a potential to uncover munitions within the SVRA or transport munitions from ABDSP® south into OWSVRA. Park staff are trained on basic munition safety, avoidance measures, and reporting requirements.

2.7.3 Barrel Springs

The Barrel Springs MU is 219 acres and is creosote scrub or mesquite dune dominated. This area is designated as open riding, but 33.5 acres are fenced off to protect cultural and natural resources. A portion of the fence consists of the Barrel Springs Cultural Preserve. There are no designated camping areas or facilities within this MU. Riding activity is generally concentrated on the trails with some dispersed riding occurring as well.

This MU is largely flat with large mesquite sand dunes mostly found within the fenced areas. Barrel Springs contains Rositas-Carrizo-Orita and Badland-Beeline-Rillito soils. Barrel Spring MU occurs in an area with a low paleontological potential.

The mesquite dune habitat found within the Barrel Springs MU is limited throughout the park. The mesquite vegetation in this area helps to catch windblown sands, creating the sand dunes. The denser vegetation in this area allows for a higher biodiversity and dune habitat for species of special concern such as Colorado Desert fringe-toed lizard, *Uma notata*, and flat-tailed horned lizard.

2.7.4 Open

The Open MU is the largest MU at 31,419 acres and designated as open riding with a few areas fenced off to preserve cultural and natural resources. This section of the park has many trail entrances from highway 78 on the southern end and contains popular camping areas and facilities. Dispersed camping occurs in the MU with concentrated camping taking place in designated camping areas and near facilities. No camping is allowed around the Shell Reef area or at the Pumpkin Patch point of interest. Riding activity is generally dispersed throughout the area with more concentrated riding on the trails and high use areas, such as the area commonly known as the Shell Reef Playground. In some areas riding can be limited to accessible corridors as natural features can act as barriers and would be difficult to travel through. Despite the variation and size of the overall, overall management is consistent throughout the MU.

The land is generally open and flat with mostly sandy substrate in the eastern and southern side of the MU. The northwestern section is predominantly composed of mud clay substrate with the land dominated with mudhills and some open areas. In some areas among the mudhills,

deep narrow washes flow and cut through the terrain making travel through the area difficult. Many large and broad washes flow through the MU, some continuing their path through the park from the Catshead MU and some flowing from East of Poleline MU or originating near the center of the MU.

Soils in the MU include Rositas-Carrizo-Orita, Badland-Beeline-Rillito, and Meloland-Vint-Indio. Terrain and vegetation type and density can vary throughout the MU, with several transitions throughout the area. Approximately 50% of this MU has a high paleontological potential, and the rest has a low or moderate potential. The MU is creosote or burrobush scrub dominated.

A small section of the MU was a well-established training ground during World War II and there is a potential for historic munitions to be present. During weather events, there is potential for munitions to be uncovered within the area. Park staff are trained on basic munition safety, avoidance measures, and reporting requirements.

2.7.4.1 Pumpkin Patch Sub-Unit

The Pumpkin Patch sub-unit is a 1,917-acre area within the Open MU (Figure 11). The sub-unit is characterized as the area northeast of East Bank Wash, north of Pumpkin Patch Trail and Lost Lizard, and South of Tule Wash. This area predominately consists of mud hills which differs from much of the terrain within the Open MU, leading to its designation as a sub-unit. Though the terrain is different, management throughout the Open MU including the sub-unit are the same.

The Pumpkin Patch point of interest can be found in the northern section of the sub-unit, just south of Tule Wash. This area does not allow for camping and has no known sensitive resources.

2.7.5 Northern Washes

The Northern Washes MU is 12,543 acres and designated as open riding. The MU has multiple large and relatively deep west to east washes that flow through the MU towards the Salton Sea. There are no designated camping areas within the MU, however camping activities are dominant near shade ramadas and facilities. Popular camping areas for dispersed camping are generally surrounding Cross Over Trail and Holly Rd as the area is close in proximity to S-22, while the remainder of the MU is generally more difficult to reach.

The land is a mixture of badland, mudhill, and sandy substrate. An assortment of terrain can be found within the MU, from flat, hilly, and rocky. with washes of varying sizes and depth cutting across the land throughout the MU. Riding activity is generally concentrated on trails both designated and social. Riding is typically limited by the terrain as the washes can make travel difficult in some areas. Fun runs within the SVRA are generally routed through this MU.

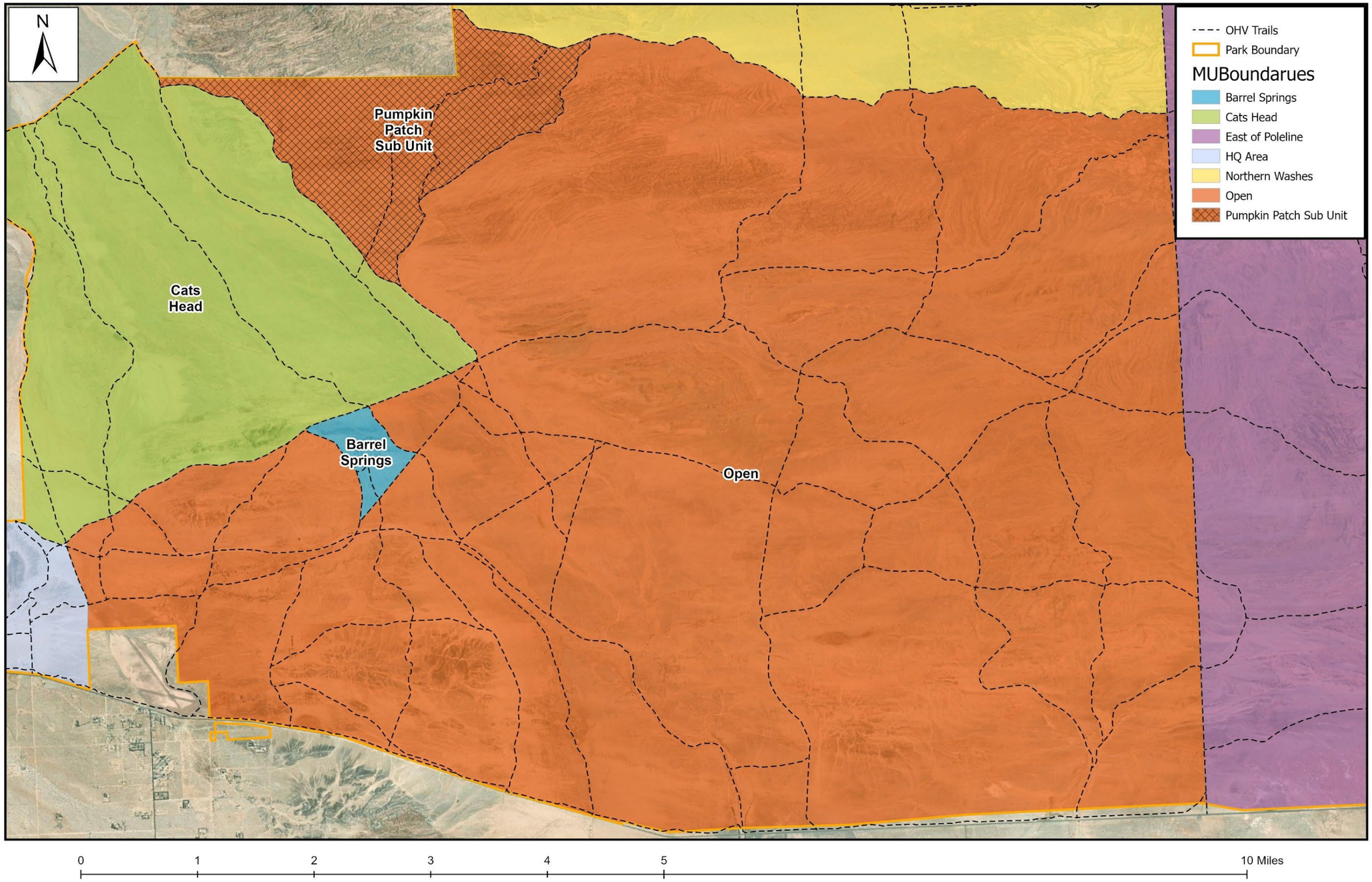


Figure 11. Pumpkin Patch sub-unit found within the Open MU.

Soils in the MU include Badland-Beeline-Rillito soils and the MU has high, moderate, and low paleontological potentials. The Northern Washes MU is creosote or desert wash scrub dominated although saltbush and burrobush scrub dominate in some areas. The washes contain sensitive resources such as Orcutt's woody aster (*Xylorhiza orcuttii)* and seeps. When conditions are right, one of the best desert sunflower displays can occur in this region of the park.

2.7.6 4x4 Area

The 4x4 Area MU is 496 acres and designated as open riding. The MU contains only one trail, 4x4 Obstacle Road, which leads into the 4x4 obstacle course. The unit is bordered by Cross Over Trail and Holly Road, and visitors can access these trails from S-22. Concentrated recreation occurs in this unit as it contains the 4x4 obstacle course, is popular for camping, and is commonly the staging area for special events.

The 4x4 obstacle course is popular among those who want to test their OHV skills. The course contains several manmade structures allowing for different challenges of varying difficulty. The area is fenced with two entrances to control the flow of traffic for public safety. A camp host pad can be found within the fenced 4x4 obstacle area. Dispersed camping occurs throughout the MU, except within the fenced 4x4 obstacle course where it is not permitted. Riding activity tends to be dispersed throughout the unit or follow social trails.

This MU is largely flat except for the 4x4 obstacle course and some additional hills next to the course and on the northwest corner. Small shallow washes can be found throughout the MU. The unit has Badland-Beeline-Rillito soils and generally has low paleontological potential however some high potential areas do occur. This MU has relatively sparse vegetation with creosote scrub as the dominate type. Some mesquite hummocks are present and generally fenced off.

2.7.7 East of Poleline

The East of Poleline MU is 24,784 acres and managed as a trails only area. This MU has mixed or checkerboard ownership between DPR, BLM, and private inholdings (Figure 4). The southern end of the unit is bordered by SR-78 while the eastern boundary is along SR-86. Popular ways to enter this unit is through Poleline Road and County Dump Road. However, other entrances can be found through Oil Well Wash from SR-78 and a few designated turnout entrances along SR-86.

This MU does not have defined campsites and has been designated for limited camping. A few facilities such as ramadas can be found within the unit. Riding activities are mostly concentrated on trails with some dispersed riding.

An assortment of terrain can be found within the MU, from flat, hilly, and rocky with mudhills as the predominant landform type. Washes of varying sizes and depth cut across the land

throughout the MU. Riding activity can be limited by the terrain as narrow deep washes can make travel difficult in some areas.

Soils in the East of Poleline MU consist of Badland-Beeline-Rillito and Meloland-Vint-Indio. There is predominately moderate paleontological potential within the MU, however there are some areas with high and low potential. Generally, vegetation is sparse in the area with creosote or burrobush scrub as the most dominate type. Renewable energy development, such as geothermal energy, has focused primarily within this MU.

The General Plan update may provide clearer guidance on regulations within this MU for the future.

2.7.8 Truckhaven

The Truckhaven MU is 7,818 acres and currently designated as open riding, with the draft General Plan proposing a trails-only designation. The MU has checkerboard ownership between DPR, SLC, and private inholdings (Figure 4). The western extent of this MU is bordered by ABDSP®. This section of the park is the northernmost part of the SVRA. There are no facilities, designated trails, or established camping locations within the MU. This area is popular for dispersed camping, though largely concentrated near the eastern and southern sections. No camping is permitted in the areas around Dusty and Notches. Riding activity is dispersed with concentration in the washes. Recreationists using Jeeps and other OHV-capable sport utility vehicles frequent this MU more than other areas in the park.

The MU largely consists of badlands, many areas of relief with few flat areas. The substrate varies between mudhills, gravel pan, sand, and large rocks. There are four large shallow west to east washes that flow through the MU towards the Salton Sea. The unit has primarily Badland-Beeline-Rillito soils, although some Gilman-Indio-Coachella soils are present in the northeast corner. There are low, moderate, and high areas of paleontological potential within the MU. There is relatively sparse vegetation in the unit which is creosote or desert wash scrub dominated.

3 MAINTENANCE PLAN

3.1 MAINTENANCE EQUIPMENT

Trail maintenance activities at Ocotillo Wells SVRA are conducted using a variety of equipment. The trail crew uses hand tools, whereas the heavy equipment operators use an array of machinery. The heavy equipment includes road grader, front loader, water truck, dump truck, service truck, tractor loader backhoe, bulldozer, excavator, skid steer tractor with multiple attachments, and other trucks, trailers, and equipment with attachments, such as a poor boy

grader, are used as needed to maintain trails throughout the park. The equipment used for maintenance is based on the trail width and the nature of the maintenance work.

3.2 UNIT-WIDE

Ocotillo Wells SVRA manages approximately 62,000 acres of open riding area and 24,000 acres of trails only area. There are 251 miles of designated trails throughout the park, of which 109 miles occur within washes. OHV recreation was popular in the area prior to Ocotillo Wells becoming a SVRA. When the park was established, these social trails were inherited, and many popular routes were designated as trails throughout the unit. As these trails were inherited, challenges may occur as they have not been engineered.

The General Plan update may change and provide more guidance on the future management and maintenance of the park.

3.2.1 Trail maintenance

A variety of trail maintenance is conducted as needed throughout the park. The frequency of maintenance is determined based on usage, identified emergency and facility access, and trail condition reports by both staff and public. Trail maintenance often encourages riders to stay on trail as some riders search for the smoothest ride, sometimes resulting in the widening of trails. The majority of trail maintenance activity occurs between early fall and late spring during the typical riding season. Standardized terminology of trail features used at the District has been created for reference and can be found in Appendix 2.

Trail grading is the most frequent maintenance action within the unit, occurring most frequently on high use trails. State Park Equipment Operators (SPEO) primarily use a grader with a 14-foot mold board to maintain trail corridors and widths. Grading activities can sometimes cause entrenchment of trails and cast material to the side of trails creating berms. To avoid excessive buildup of berms and entrenchment of trails, berm material is brought back into the trail, allowing the trail to be more level with the surrounding terrain. SPEO aim to avoid existing vegetation while grading, particularly the driplines of desert ironwoods, but in situations where immature vegetation has sprouted along the trail corridor, these plants may need to be removed to maintain the existing route. Maintenance and resource staff coordinate non-routine grading to minimize potential impacts to sensitive cultural and natural resources.

3.2.2 Washes

Larger washes are identified as designated trails and used as routes of travel. Maintenance of washes are usually minimal as these features have high disturbance cycles through flash flooding events. Depending on the intensity of a flash flood and the shape of the wash, a portion of or the entire wash could flow. Flooding events can wash away OHV tracks. When previous routes are erased through flooding activity, those traveling after these events

generally follow the easiest path through the wash and establish a new path of travel for others.

On occasion, a trail groomer is used within washes to reestablish the trail corridor following floods or to reduce washboard conditions. Typically, a trailer mounted hydraulic rake, referred to as a “poor boy grader,” is used to groom the trails. A tire drag or chain link drag have been used previously for grooming purposes.

High use crossings between major trails and washes are graded similarly to trails. Low to moderate use crossings between washes and trails are not graded to the same degree. In these areas, trails are graded up to the wash on either side of the crossing, leaving the wash untouched. Shallow berms are present to define the trail entrance from the wash.

3.2.3 Weather events

Weather or storm events can trigger maintenance activities for flooding, ponding, or large sand drifts. Flooding activity can cause damage to the trails and make travel difficult by creating ruts, washing out trails, unexpected subsurface drainage, potholes, or the like. Trails are reestablished once soil moisture conditions are safe to conduct maintenance activities. Working while the soil is too damp or wet can cause equipment to get stuck and sink into mud, resulting in additional damage to the area.

Ponding or pooling may occur within the trails after heavy rainstorms. A water or trash pump is used to remove water from the trail and move it to an area of lower elevation. When displacing water, the discharge hose is placed on top of a tarp to prevent the creation of ruts within the soil and allow the water to spread over a larger area. Once the pooling is removed, material is pulled from the berms and brought into the center or the lowest spot of the trail. The trail is then graded to reestablish the trail corridor. Road base mixed with native stockpiled material may be used occasionally to augment the materials placed into low spots to reduce the likelihood of recurrent flooding. Like with flood damages, maintenance occurs once conditions are safe to use heavy equipment.

3.2.4 Sand Drifts

Sand drifts build up over time along high use trails used for emergency and facilities access. Most common buildup of drifts occur on Poleline Road, Cahuilla Trail, and Gas Domes Trail. Equipment is used to remove these drifts off the trails and largely towards the natural direction sand would have migrated towards, usually towards the east. Occasionally, storms may clear these sand drifts through wind or water movement.

3.2.5 Dust Control

Recurrent dust control methods used within the unit generally consist of spraying water on trails and using dust control products or binding agents. Watering occurs generally during the riding season when trails are heavily trafficked or prior to special events. This dust control method is often used on main trail entrances prior to popular riding weekends, such as holiday weekends or coinciding with special events. Popular weekends occur on or around Halloween, Thanksgiving, New Years, President's Day, and the first weekend of March.

Factors which are considered for spraying include wind conditions, traffic levels, and air temp. Water is typically sprayed on days of light winds as high winds may cause the water to be blown away from the intended areas. For general safety and operation, spraying occurs during times of lighter traffic and in areas where it is safe for SPEO to operate equipment. Commonly, days of high temperature and low humidity are avoided as the water evaporates too rapidly decreasing the effectiveness as a dust control. During drought conditions, watering may be reduced and other dust control methods may be more frequently applied.

Binding agents are applied every couple of years prior to the riding season, in early fall. Application tends to occur when riding activity is low, allowing the product time to settle and harden. SPEO usually grades trails in preparation of binding agent application. A contractor or vendor would then apply the dust control product using a spray truck. Current trails that receive dust control treatment are trails, not in washes, accessed from SR–78 or S–22 (Figure 12).

Dust control products tested by the District during the initial dust treatment pilot study include naturally derived products such as lignin sulfonate, magnesium chloride, calcium chloride, and "Durasoil". The product of choice has mostly been lignin sulfonate, largely due to its ability to bind soils together without ambient humidity. Binding agents are limited to spray within the actual path of travel within the roadbed with directional spray guards used to prevent overspray. Maintenance and resource staff coordinate prior to the application of binding agents to ensure sensitive cultural and natural resources are avoided.

Both water and dust control product are largely applied from the highway entrances up to a quarter of a mile into the trail. However, depending on the trail or use conditions, water may be applied at various lengths on the trails. Additional efforts may occur for special events, specifically in the 4x4 Area MU.

3.2.6 Road Base

Road base (base) or virgin base is used throughout the park for a variety of situations. Base is used for parking areas such as those in the Headquarters MU. If additional material is needed in an area, base is used to help build up concrete pads or trails throughout the park. Base is also often used to fill potholes within trails. Generally, water is added to a mixture of road base and

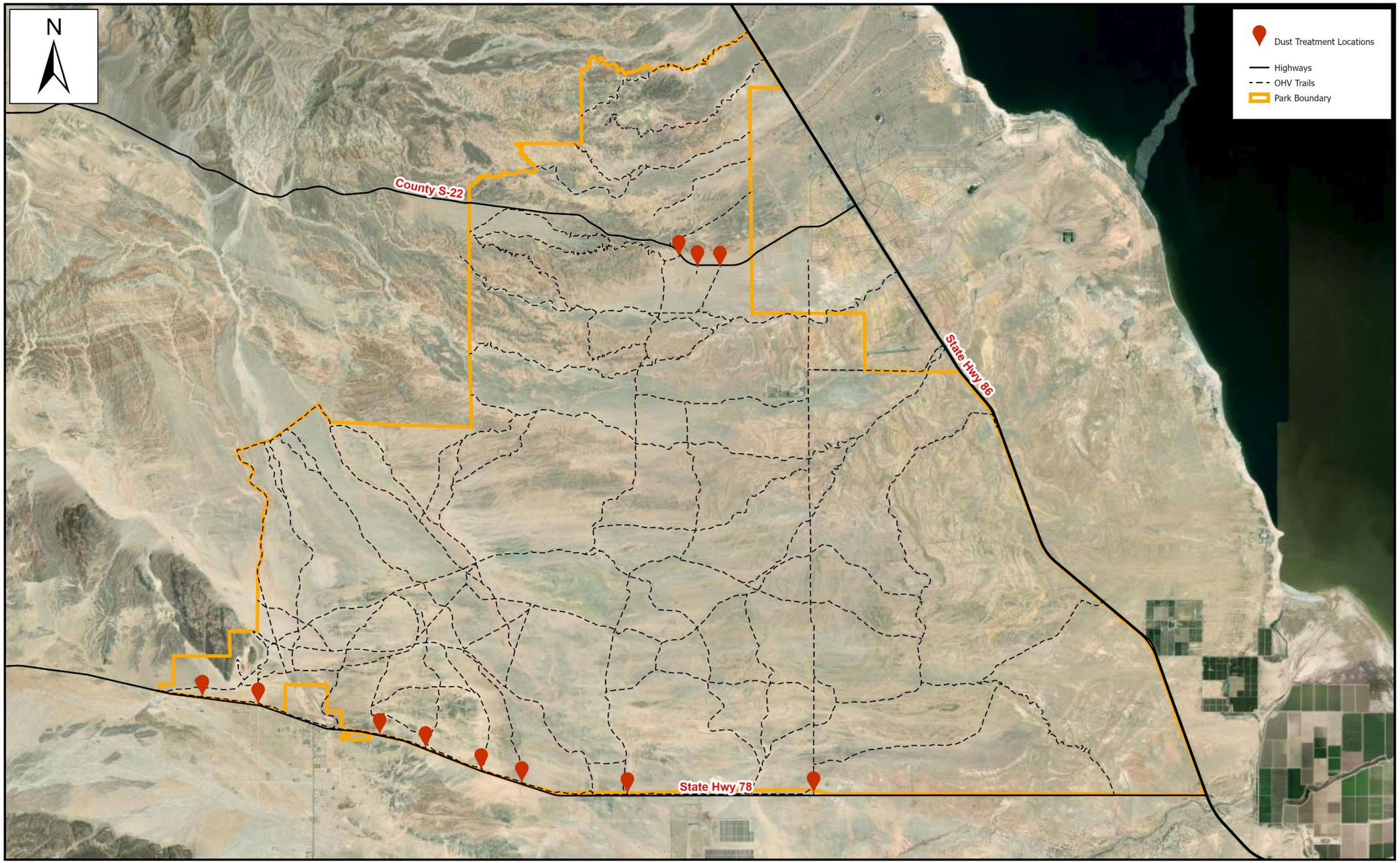


Figure 12. Current trail entrances that receive dust control treatment.

native soils to help bind the material as fill. Heavy equipment is used to transport, place, move, and compact base as needed.

3.2.7 Fencing

A variety of fencing or barriers are used throughout the park to protect areas or to delineate facility areas around the District Headquarters and Toner Property. Maintenance generally consists of replacing posts and rails that have been displaced or worn over time through weathering. Any soil material that is displaced during the installation of the fence is used to backfill the area it was dug out from. Fences located in areas prone to drifting sand buildup, such as at Barrel Springs, occasionally require additional fencing materials to be placed next to and on top of the existing fence posts to add height and to ensure that the barricade remains effective in protecting the resources.

3.2.8 Concrete Pads

Concrete pads for accessible parking and access for restrooms, shade ramadas, and other similar facilities are found throughout the unit. Through natural weather events and OHV activity, soil levels around the concrete pads may decrease, exposing the edges of the concrete. To cover the exposed edges, heavy equipment or hand tools are used to either move native soil from within the area or place base around the concrete pad to make it flush with the surrounding area ADA compliance.

3.2.9 Trail Markers and Signage

Carsonites and signage are placed throughout the park to indicate trails, park boundary, and regulations. Carsonites and trail signs are placed along designated trails to delineate the routes. Each carsonite marker has the name of the trail and the associated mileage for the post's location along the trail. Markers are placed roughly 1/10th of a mile from each other, generally within line of sight, to clearly indicate the trail. Weather events such flooding can damage or wash away markers and signs, especially those within washes. It is important to have these indicators replaced as soon as possible once conditions are safe to travel. The presence of these markers helps delineate trails and the park boundary when they are difficult to distinguish. Outside of large storm events, markers and signs are regularly maintained and replaced as needed.

3.2.10 Restoration Techniques

3.2.10.1 Native Planting and Vertical Mulching

Native planting and vertical mulching methods are used for restoration throughout the park. Vertical mulching is a technique using dead or downed plant material and placing them into the ground to look as natural as possible to create a visual barrier. This technique is generally used

in areas of off trail encroachment, to encourage riders to stay on the trails. Native plantings are generally used to revegetate a restoration area. Digging may be required for both methods.

3.2.10.2 Volunteer Trail Restoration

Volunteer trails are restored through decompaction and blending. The general purpose of decompaction is to loosen soil that has been compacted from riding activities and allow for the possible vegetation recruitment and growth. Depending on the project areas and scale of restoration, decompaction is conducted through hand rakes or heavy equipment.

After decompaction, the areas of impact are blended to look like the native surroundings. Generally, hand rakes are used to erase tire tracks while vertical mulching, native planting, and native seed casting may also occur.

3.2.11 Graffiti Carvings

Graffiti carvings are occasionally found along tall wash walls or rock features throughout the park. Previous carvings have been found along the walls of Arroyo Salado, Tule Wash, Fault Wash, and Tectonic Gorge. The carvings on wash walls are generally removed using a pressure washer for a semi-natural look. Graffiti on rocks are generally removed using a sandblaster.

3.3 HEADQUARTERS MU

The Headquarters MU is highly trafficked by a variety of OHVs. Highly maintained trails within this MU include Ranger Station Road, Benson Lake Loop, Mesa Trail, Quarry Road, and Main Street. Maintenance of these trails occur throughout the year and consist of trail grading, dust control, or weather-related maintenance. Other MU trails are maintained as needed, usually during the riding season.

'Donuts' are created over time within the MU through riding activity, particularly near popular camping areas. A 'donut' is terminology used to describe a feature that is made by motorized vehicles repeatedly driving in a circular pattern in the same location. This activity forms a depression in the ground leaving the center untouched. Often this type of activity surrounds vegetation or large rocks. Depending on the size and depth of these features, hand tools or heavy equipment are used to backfill native soils from the area into the depression. The filled areas are made level to the surrounding area and water can be used to help consolidate the loosened material.

3.4 CATSHEAD MU

The Catshead MU consists mostly of designated routes through washes, apart from Cut Across Trail at the top of the MU. This MU is subject to flooding during large rain events, which can result in changes to the wash channels as flowing water will seek the lowest point in the wash.

The best routes of travel after flooding events are usually delineated by low points and general flow of water. Due to the nature of this MU, all trails within the MU require little maintenance.

The Catshead Rehabilitation project began in 2021 to reduce the overall amount of volunteer trails and improve native vegetation and habitat for wildlife. Volunteer trails are scrubbed up to 50 meters from mapped trails. The disturbed areas have been restored to a natural look through methods such as raking, rock placement, native plantings, and vertical mulching. Signs are used to encourage the public to stay on designated trails. Restoration will be maintained over time.

3.5 Barrel Springs MU

Barrel Springs MU contains a fenced resource protection area. Aside from irregular fence repairs for the cultural preserve, no unique maintenance or management of the dunes occurs. Routine maintenance, such as grading occurs on most of the trails within and bordering the MU.

A fence expansion is planned to increase the fencing around the existing fence by approximately 1.6 acres. Restoration work will occur within the expanded fence to remove a well-used volunteer trail that currently leads around the perimeter of the fence.

3.6 Open MU

The Open MU has high use and high maintained trails within this MU. These trails include Cahuilla Trail, Country Line Road, Gas Dome Trail, Ocotillo Road, Shell Reef Expressway, and Wolfe Well Road. Maintenance on these trails includes frequent grading and occasional dust control throughout the year, though concentrated during the riding season.

Cahuilla Trail follows a historic service road that leads to the Standard Oil well which was in operation in 1944. The road was stabilized using low grade oil mixed with local sands and large pieces of this tarmacadam (tarmac), which can be seen alongside of the road today. This trail is a popular entry point into the park, provides access to campsites, and is used for emergency and facilities access, so it is regularly graded. While grading is done similarly to other areas within the SVRA, it is important to maintain the width of the trail corridor and avoid direct disturbance of the side cast tarmac to protect the remaining historic road.

Cahuilla Trail has sand dunes that cross the trail in the northern section between the intersections with Gas Dome Trail and Poleline Road. The trail is important for emergency access, but also provides important dune habitat for sensitive species, such as the Colorado desert fringe-toed lizard. Reducing disturbance to the dunes over time would improve habitat quality and reduce maintenance needs in this area. While there are currently no plans to relocate the emergency access corridor, any future consideration would be discussed by district core programs and likely would be implemented through a phased approach.

3.7 NORTHERN WASHES MU

Trails in the Northern Washes MU primarily consist of washes crossing the MU from the west to the east. The washes within this MU vary between broad and flat washes and deep washes with tall walls. These washes are subject to flooding during large rain events. The best routes of travel after flooding events are usually delineated by low points and general flow of water. Due to the nature of these washes, the designated trails within the washes commonly have low maintenance efforts.

Outside of washes, there are four designated trails, Cross Over Trail, Holly Road, Veterans Pass, and Freedom Trail. Maintenance focuses on the first mile of Cross Over Trail from S-22 and Holly Road throughout the year based on need. Cross Over Trail and Holly Road are popular trails and are regularly used during special events in the area.

In the early 2000s, Veterans Pass was created to partially follow a World War II era road referred to in records as Military Dump Road. Veterans Pass is roughly three miles long, following a generally straight east to west orientation. It is utilized by park visitors, as well as park staff accessing existing facilities at Pumpkin Patch. Due to the historic nature of portions of Veterans Pass, a maintenance protocol for the trail has been developed, which can be found in Appendix 3. In general, the historic section of trail is maintained as a narrow trail corridor with shallow berms. Due to the narrowness of the maintained trail, a dozer or skid steer will generally be used. Maintenance will occur once a year with a cultural monitor present.

In September 2020, a military F35 crashed south of Holly Road. The U.S. Marine Corps (USMC) and Parks have cooperatively worked on the clean-up and restoration of the site since the event occurred. The primary area of impact covered an approximately 4.3-acre area, not including access roads. Large debris and contaminated soil have been removed from the site, but efforts to restore the area are ongoing. The ground has been contoured so no obvious scars are left. Clean-up efforts required the rapid expansion of access routes into the area, which have also been utilized by OHV recreationalists exploring the area. Dust control measures, primarily watering and speed limits, were implemented during the early stages. As future work remains uncertain, efforts will be documented through the annual compliance report and action plan.

Exploratory geothermal seismic study occurred within the MU in April 2021 using vibroseis buggies. These specialized vehicles drove along designated drive paths within portions of both the Northern Washes and East of Poleline MUs, stopping at designated points to generate source vibrations that would be captured by receiving stations. Restoration activities were initiated in October 2021 on the trails and vibration sites that were created by the vibrioseis buggies. Restoration included decompaction and masking of trails through raking. Signs were placed to encourage the public to stay on designated trails. Ongoing monitoring of the area assesses the efficacy of restoration and signage, with maintenance occurring as needed.

3.8 4X4 AREA MU

The 4x4 Area MU is highly trafficked by a variety of OHV activity and camping. Only one trail, 4x4 Obstacle Road, is within the MU which leads to the enclosed 4x4 obstacle area. The 4x4 obstacle course is fenced to protect resources and provide controlled access into the 4x4 area.

Features within the 4x4 obstacle area require regular maintenance. Hill climbs on the northern side of the 4x4 obstacle area are maintained annually, currently just before the Tierra Del Sol (TDS) special event. Hill climbs are filled in, generally using fill dirt from the stockpile at the Toner property or from provided fill dirt from the county. Previously, the soil used as fill were from washes located around S-22 removed by the county but that was stopped to reduce spread of invasive Sahara mustard. When repairing these hill climbs, a ripper blade is used to rip the hill side and break the soil up. Stockpiled material is placed at the bottom of the hill climb where a water cannon or hose lay can wet the material prior to mixing, allowing for better cohesion. The wetted material is gradually pushed up the hill climb by a dozer. The process of moving material upwards into the hill climb is done several times and then track compacted using the weight of the heavy equipment. The entirety of the process is continued until the original hill height has been reestablished. In the future, this work may be scheduled post-event.

Additional maintenance within the obstacles generally involves the removal of windblown sand from within obstacles, replacement of obstacle pieces, covering obstacle edges, and resetting features. Removed sand is spread out in the nearby area where the material would have naturally blown towards. Details of maintenance of each obstacle can be found in Appendix 4.

A fenced storage area is along the northern boundary of the 4x4 Obstacle area. This storage area is generally cleaned annually by removing stored materials from inside the fence and then clearing the sand build up. The sand is placed and spread just outside the fenced storage area with heavy equipment.

This MU is often used as a staging area for special events, which include fun runs or poker runs through the Northern Washes MU. One notable event is TDS, an annual fun run that begins from Holly Road and ends at Cross Over Trail. Past events have included a fenced vendor area outside the 4x4 obstacle course, but since 2019, the vendor area has been located outside the SVRA. During these events, higher activity occurs along Holly Road and Cross Over Trail as visitors often camp along the trails. During large special events, dust control treatment such as spraying water is applied prior to events.

3.9 EAST OF POLELINE MU

East of Poleline MU is managed for trail riding only. Maintenance of trails within this MU are focused on Poleline Road and Gas Domes Trail. Occasional maintenance occurs on Cahuilla trail, typically using a bulldozer, to remove sand drifts. Remaining trails do not have routine

maintenance, with work occurring as needed. Both Poleline Road and Gas Domes Trail are high use and are maintained frequently to reach facilities, for emergency access, and interpretation programs. Maintenance is typically performed during the riding season, however depending on conditions, maintenance may occur throughout the year.

Maintenance of Poleline Road is typically done through grading, however abnormal conditions occasionally require alternative maintenance. Large sand drifts build up along the trail, particularly the cross section between Poleline and Eriogonum Wash. Heavy equipment is used to move the sand off the road and largely towards the direction the sand would have naturally migrated, usually towards the east. Occasionally, storms may clear these sand drifts through wind or water movement. Currently, the park is in talks with consultants discussing long term maintenance strategies for storm water erosion.

Potholes can develop over time on Poleline Road from weather events and heavy vehicles traveling along the trail. Heavy equipment is used to fill the hole and compact the area. A combination of native material from the area and water are used to fill the potholes. On occasion, base is added in as part of the fill mixture. Once the hole has been filled and compacted the trail is then graded.

Gas Domes Trail, east of Poleline Road, occasionally has ruts form on the trail due to storm events and mechanical erosion. Closure of the area using signs may be appropriate in wet conditions. Trail grading may resume once soil moisture levels are safe to operate heavy equipment.

Exploratory geothermal seismic study occurred within the MU in April 2021 using vibroseis buggies. These specialized vehicles drove along designated drive paths within portions of both the Northern Washes and East of Poleline MUs, stopping at designated points to generate source vibrations that would be captured by receiving stations. Restoration activities were initiated in October 2021 on the trails and vibration sites that were created by the vibrioseis buggies. Restoration included decompaction and masking of trails through raking. Signs were placed to encourage the public to stay on designated trails. Ongoing monitoring of the area assesses the efficacy of restoration and signage, with maintenance occurring as needed.

A new invasive plant, *Volutaria tubuliflora* (desert knapweed), has been found within this MU off County Dump Road in 2020. This new invasive species to the park can spread similarly to Sahara mustard. The initial population was removed and the area is regularly monitored for signs of this invasive species. As a precaution, no fill material is sourced from this location, and equipment working or staging in the area is inspected and cleaned to limit the spread of this invasive into the park.

3.10 Truckhaven MU

The Truckhaven MU is the northernmost MU within the park. This MU has only one signed trail, Truckhaven Trail, aside from washes. Several washes, such as Anza Ditch, Palm Wash, Coral Wash, and Grave Wash, are designated trails. This MU is popular for riding and camping. There are no facilities within this MU. Future management of this area may result in a shift to trails only recreation, except in designated concentrated use areas.

Truckhaven Trail is owned by Imperial County. Ocotillo Wells District staff conducted maintenance once on the trail entrance through a MOU. This restored the entrance to a serviceable level of access for park visitors, with Imperial County agreeing to maintain the restored condition. There is no regular occurring maintenance in this MU by Ocotillo Wells District.

In 2019 and 2020, two restoration projects, Truckhaven Palm Bowl and Truckhaven Palm Flats Restorations respectively, occurred within the MU. Both restoration sites have recurring maintenance to maintain the restoration site. This can include native plant management and fence maintenance. In the future, interpretation panels will be installed at both restoration sites.

4 State and Regional Conservation Plans Considered

PRC §5090.32(g) requires that WHPPs and management plans be developed in consideration of statutorily required state and regional conservation objectives. While a similar requirement was not included for SCPs, an important step of identifying park-specific objectives is understanding broader regional conservation goals several state and regional conservation objectives are identified that are relevant to Ocotillo Wells SVRA.

4.1 State Conservation Objectives

4.1.1 State Wildlife Action Plan

The State Wildlife Action Plan (SWAP), developed by the California Department of Fish and Wildlife in concert with several partners statewide, provides a blueprint for conservation of wildlife and their 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.

The SWAP has divided the state of California into seven provinces and developed regional conservation strategies for each. Ocotillo Wells SVRA falls within the Colorado Desert Ecoregion

of the Desert Province, which has 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%.

This 2022 SCP supports these SWAP goals by conserving soils over time within the SVRA. As a SVRA, the park meets the SWAP objective to maintain acres of habitat.

4.1.2 2018 Safeguarding California Plan

Developed by the California Natural Resources Agency, the updated 2018 Safeguarding California Plan 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 California State Parks and conservancy 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.

In addition to conserving soils, the 2022 SCP provides Ocotillo Wells SVRA management information and recommendations necessary to maintain sustainable recreation opportunities for the public.

4.1.3 California Healthy Soils Action Plan

The California Department of Food and Agriculture created a California Healthy Soils Action Plan. This plan is an interagency effort to promote the development of healthy soils on California's farm and ranchlands through innovative farm and ranch management practices that contribute to building adequate soil organic matter. While the SCP is outside of the primary scope of the Healthy Soils Action Plan, both plans share common goals targeting soil health. This includes reducing erosion and dust, improving wildlife diversity and habitat, and increasing water retention.

4.1.4 Salton Sea Management Program Phase I: 10 – Year Plan

In 2018, the State of California developed the Salton Sea Management Plan (SSMP) in response to the California Water Action Plan, which balances statewide water supply security with protection of public, economic, and ecological health. The program identified short- and medium- term goals to respond to air quality and ecological threats at the Salton Sea. A short-term goal was identified to meet 9,000 acres to 12,000 acres of dust suppression and habitat projects. A medium-term goal was identified to establish 18,000 acres to 25,000 acres of dust suppression and habitat projects. The projects would be to protect or improve air quality, wildlife habitat, and water quality as needed to minimize human health and ecosystem impact at the Salton Sea.

While the SCP is not directly relevant to the Salton Sea, the proximity of the Salton Sea means that it is often considered in park planning.

4.2 Regional Conservation Objectives

4.2.1 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 SCP 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 particular relevance to the SCP 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, with direct or indirect benefits to the following identified goals:

- 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.

4.2.2 Imperial County Air Pollution Control District

ICAPCD monitors and regulates air quality within Imperial County. Of relevance to Ocotillo Wells SVRA, the ICAPCD manages the emission of particulate matter less than ten microns in diameter (PM_{10}). Historically, the county has been in non-attainment for PM_{10} within a 24-hour period. An update to federal standards has allowed the ICAPCD to request re-designation to attainment when exceptional events (i.e., high winds) are excluded from the dataset. Based on historical monitoring, the ICAPCD was able to show that all exceedances of the 24-hour PM_{10} threshold were during exceptional events.

The ICAPCD's Regulation VIII covers fugitive dust through a variety of rules. Rule 800, General Requirements for the Control of Fine Particulate Matter, applies to Ocotillo Wells SVRA. Ocotillo Wells SVRA has a Dust Control Plan that addresses the requirements of Rule 800, with further implementation support from the Soil Conservation Plan.

4.2.3 San Diego County General Plan

Like the Imperial County General Plan, State Parks is not subject to or required to comply with the San Diego County General Plan. Despite this, the objectives listed within the plan were considered during the development of the SCP objectives. The County's General Plan is based on a set of guiding principles designed to protect the County's unique and diverse natural resources and maintain the character of its rural and semi-rural communities. This plan balances land-use policies and programs throughout the county while considering socioeconomics, resource management, development density, and many other factors. Of particular relevance to the SCP is the County's Conservation and Open Space Element. This portion of the General Plan considers resource management for ecological, development suitability, public health, sensitive resource values.

The Conservation and Open Space Element identifies several broad conservation goals divided by nine sections, with direct or indirect benefits to the following identified goals:

- Protect ecological and lifecycle needs as well as associated habitats,
- Conserve and protect water resources,
- Protect and preserve cultural resources,
- Preserve geologic and paleontological history,
- Manage mineral deposits,
- Reduce emissions and promote renewable energy sources and conservation, and
- Ensure park and recreational facilities serve current and future residents.

4.2.4 San Diego County Air Pollution Control District

The San Diego County Air Pollution Control District (SDCAPCD) monitors and regulates air quality. Of relevance to Ocotillo Wells SVRA, the SDCAPCD manages the emissions of particulate

matter less than ten microns in diameter (PM_{10}). Historically, the county has been in non-attainment under state PM_{10} air quality standards for PM_{10} within a 24-hour period. Within federal designation the county has been designated as unclassifiable. At the time of designation, the available data did not support a designation of attainment or nonattainment and therefore designated as unclassifiable.

4.2.5 Desert Renewable Energy Conservation Plan

The DRECP is a federal plan focused on renewable resources and reducing greenhouse gases through collaboration between multiple agencies within the Mojave and Colorado desert regions in Southern California. The DRECP has two broad level goals guiding the overall biological conservation planning. One is to provide long-term conservation and management special status species in the area. The other, which is more aligned with the SCP, is preserve, restore, and enhance vegetation and ecosystems that support the special status species in the area. The SCP supports these goals by seeking to reduce soil disturbance which will help to preserve habitat over time within the SVRA.

4.2.6 Anza-Borrego Desert State Park® General Plan

The overall goal of the Anza-Borrego Desert State Park® General Plan is to provide management guidelines that will enable visitors to enjoy the park while protecting the resources unique to the park. The intent is to provide public access and enjoyment of resources without harming the resources that the public values for recreation experiences. The plan contains one soil specific goal, which is to protect sensitive soils and promote further understanding of the role soil and soil biota in desert ecosystems. The Ocotillo Wells SVRA SCP broadly aligns with this soil goal due to its focus on the conservation of soils within this region.

4.2.7 Flat-tailed Horned Lizard Rangewide Management Strategy

Developed by the Flat-tailed Horned Lizard Interagency Coordinating Committee, the 2003 Flat-tailed Horned Lizard Rangewide Management Strategy was developed to provide guidance for the conservation and management of habitat to maintain the populations of flat-tailed horned lizards (FTHL) within its range. The document identifies objectives to secure sufficient habitat, and to limit the loss of habitat and subsequent effects on the species. The 2022 SCP supports these goals by seeking to retain soil within the SVRA therefore limiting loss of habitat.

4.2.8 BLM Routes of Travel for Western Imperial County

BLM has designated legal routes of travel for motorized vehicles in the western Colorado Desert (WECO) across their lands. The emphasis of the WECO plan is to designate routes that protect cultural, wildlife, and other sensitive resources throughout the area while providing visitors access to historic sites, wilderness, recreational activities, and wildlife viewing. This trail

network contains trails that lead into the SVRA or connect BLM trails with SVRA designated routes. Through the MOU, DPR conducts maintenance on SVRA designated routes, regardless of BLM or State Parks ownership. The Ocotillo Wells SVRA SCP aligns with the emphasis of this plan by maintaining the soil quality throughout the habitat and the trails that allow visitors access to historic sites, wilderness, recreation activities, and wildlife viewing.

5 GOALS AND OBJECTIVES

Based upon the 2020 Standard, the SVRA has identified park-specific goals objectives. These were developed following a resource assessment, review of state and local conservation objectives, and identifying maintenance activities that are currently conducted. Establishment of objectives allow for monitoring programs to be implemented that have performance standards identified, so success and/or progress can be effectively measured.

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 SCPs to incorporate BAS. In some instances, objectives may not currently meet the S.M.A.R.T. criteria; in these cases, information has been provided about what is needed and how long it is anticipated to develop a S.M.A.R.T. objective.

Through SCP implementation, the necessary baseline information will be gathered, and subsequently objectives will be updated to meet the Standard. Where S.M.A.R.T. objectives have not yet been identified, 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 SCP annual report, as well as the action plan.

5.1 CONSERVATION OBJECTIVES

Goal 1. Manage Ocotillo Wells SVRA's soils for long-term prescribed use and manage erosion or sedimentation around trail facilities.

- **Soil Conservation Objective 1 (SCO1).** By 2025, establish and implement a long-term management and reporting framework targeting anthropogenic sources of erosion or sedimentation throughout Ocotillo Wells SVRA.

Soil conservation is an important component of the resource program at Ocotillo Wells SVRA. The park is composed of a variety of desert terrain, some of which allows for open riding and others for trails only. It is important to monitor the property for long-term sustainability. Trail and wash assessments will be used to assess the success of meeting this goal.

- **Soil Conservation Objective 2 (SCO2).** Minimize off trail disturbance in the Catshead MU through 2029.

Vegetation plays an important role at Ocotillo Wells SVRA by helping to hold soil in place and can collect windblown sands. As there is minimal vegetation within the SVRA, the vegetation that is present is vital to conserving soil at the unit. The goal is to allow for OHV recreation while minimizing off trail travel and avoiding significant vegetation loss.

The focus will be on the Catshead MU. As mentioned previously, a shift from allowing open riding to trail riding in this area may change management practices in the future. Additionally, this area has a higher density of vegetation in addition to occasional flooding activities. With the assistance of intermittent flooding activities, minimization of off trail travel activity can be managed more effectively as flooding can occasionally wash out OHV tracks from off trail travel. Wash assessments will be used to assess the success of meeting this goal and inform the location of volunteer trails stemming from mapped trails. As needed, rehabilitation projects may be conducted to reduce duplicative or unwanted volunteer trails.

Goal 2. Manage erosion and soil disturbance in open ride areas of Ocotillo Wells SVRA.

- **Soil Conservation Objective 3 (SCO3).** By 2029, document and assess erosional features, such as hill climbs, within the Truckhaven MU.

The Truckhaven MU is the most recent large land acquisition within the SVRA. Prior to the acquisition, OHV activities occurred within the MU area resulting in many social trails. Although the property was acquired in 2010, there is currently limited knowledge of the inherited trails and existing erosional features within the MU.

An inventory of erosional features within DPR owned lands of the MU is to be compiled by 2029 focusing on hill climbs, as this feature type is known to be within the MU. This data will show quantity, locations, and conditions of erosional features to determine the need for maintenance activities or monitoring of specific areas more closely in the future. An assessment protocol is expected by 2025 with inventory data collection beginning in 2025. The inventory is anticipated to be completed by the end of 2029, with subsequent projects developed to target priority areas, as appropriate.

- **Soil Conservation Objective 4 (SCO4).** Manage soil disturbance within concentrated use areas, staging areas, and camping areas through 2029.

Concentrated use areas, staging areas, and campgrounds have a potential to impact soils due to higher concentrations of anthropogenic activity, of which the SCP will primarily focus on vehicular activity. Around these concentrated use areas are transition zones where riding activity naturally dwindles from higher use. These transition zones have not been formally monitored in the past, so initial efforts will focus on establishing a monitoring method to measure the extent of changes within these areas by 2025. Depending on activity levels, transition zones have the potential to expand and contract over time. Subsequent biennial monitoring will inform if maintenance or rehabilitation actions are necessary based on observed changes.

6 MONITORING PLAN

6.1 ASSESSMENT FOR EROSION POTENTIAL

Through this iteration of the SCP, new monitoring systems will be developed. Previous monitoring was largely informal, and baseline conditions were not established for any monitoring. Protocols are to be developed and pilot studies are to occur thereafter, with changes made over time. Protocols will be appended to the SCP or annual reports as they are developed. Results of assessments will be reported in the annual Soil Conservation Plan Compliance Report. Additional information on monitoring methodology can be found in Appendix 6.

6.1.1 Trail Assessments

Formal trail assessments will be implemented through the Soil Conservation Plan. Through this iteration of the Soil Conservation Plan efforts will be made to formalize when and how trail assessments are completed. With no previous formal assessments, a true baseline has not been established but anecdotally trails such as Poleline Road, Gas Domes Trail, and Quarry Road have previously had reports and maintenance of erosion.

The 2020 Soil Conservation Standard and Guidelines Appendix 3 contains an example, "Trail Evaluation Form" for conducting trail assessments. From this document, district staff have modified some of the metrics to better match assessment needs at Ocotillo Wells SVRA, focusing on mapped trails outside of washes. An additional wash assessment will be developed to assess trails within washes. The trail assessment protocol was developed in early 2023, found in Appendix 7. These trail assessments will contribute to the development of the annual maintenance plan.

Formal assessments of the entire park's road and trail system will not happen within a single year. There are specific high use trails that will be assessed annually such as Poleline Road, Shell Reef Expressway, and Gas Domes Trail. Aside from high use trails, trails will be assessed on a rotating cycle over a five-year period, with baseline conditions anticipated for all trails by 2029. As this is the first iteration of the protocol for trail assessments, there may be changes as timing and conditions are better understood.

6.1.1.1 Wash Assessments

A variety of washes can be found within the park, varying in depth and width. As these systems are dynamic and change based on the natural flow of flooding activities an assessment will be developed specifically for mapped trails within washes. The protocol will be developed and is anticipated by 2025. Monitoring will focus on identifying ingress and egress of volunteer trails

from mapped trails. Similar to trail assessments, washes will be assessed on a rotational basis with baseline conditions for individual trails developed as they are assessed.

Assessments within Catshead MU will be used to identify areas of work for the Catshead Rehabilitation Project. In the future, washes in the Catshead MU may be monitored more frequently to observe changes from the updated general plan while other washes may be a rotation.

A protocol will be developed and implemented by 2025. Baseline conditions are anticipated for all trails by 2028, at which point the objective will be updated in the annual report to be S.M.A.R.T.

6.1.2 Open Ride Area Assessments

Through this iteration of the Soil Conservation Plan efforts will be made to formalize assessments of open ride areas. As this will be the initiation of assessments at OWSVRA, formal assessments of the entire park's open ride area will not happen within this first iteration of the document.

Assessments will be geared towards erosional features and high use areas within the open ride areas as these have higher potential for anthropogenic soil movement or erosional damage. Features or areas identified as such include hill climbs, trails, staging areas, and camping areas. Specific areas with these features include the Pumpkin Patch sub-unit, Truckhaven MU, and concentrated use areas. An assessment for each of these identified areas is to be created.

6.1.2.1 Truckhaven Baseline

Baseline knowledge of the Truckhaven area is limited and a better understanding of this MU is needed to inform maintenance needs. An inventory for erosional features within DPR owned property of the MU is to be collected. To create this inventory, a phased approach will be taken focusing on individual feature types. In this iteration of the document, a protocol is to be developed to inventory hill climbs within the MU. Information on quantity, locations, and conditions of these features will inform maintenance needs and to assess compliance with the Standard.

A protocol is expected by 2025 with inventory data collection beginning in 2025. Baseline will be established by 2029, at which point the objective will be updated in the annual report to be S.M.A.R.T.

6.1.2.2 Concentrated Use Areas

Monitoring high use areas, such as concentrated use areas, staging areas, and camping areas, will occur by measuring the change in transition zones associated with the high use areas. Transition zones are areas where concentrated riding activity transitions to normal riding

activity. Monitoring of these areas will inform if concentrated OHV activity is expanding or contracting and if there is the need for maintenance or restoration actions. Once a protocol is developed high use areas will be assessed on a rotating cycle thereafter.

A protocol will be developed by 2025 with implementation in 2025. Baseline will be established by 2027, at which point the objective will be updated in the annual report to be S.M.A.R.T.

6.2 Additional Monitoring

6.2.1 Pumpkin Patch Assessment

Monitoring of erosional features, such as hill climbs, will take place in the Pumpkin Patch sub-unit of the Open MU. This sub-unit is largely comprised of mudhill substrate unlike most of the MU, as such maintenance activities and methods can differ. Monitoring efforts will assist in informing erosion rates on hill climbs, which can better inform maintenance needs within the sub-unit area. A protocol is anticipated in 2026, with assessments conducted once a year thereafter. At this time, data collection is informational and meant to bolster anecdotal knowledge; if management actions are needed, a S.M.A.R.T. objective may be defined in the future.

6.2.2 Post-Stochastic Event Monitoring

Following a sizeable stochastic event (i.e., earthquake, flooding, and storm event), park staff assess roads and improved trails for erosion issues resulting from the event. Depending on the scale of event, all or a portion of roads and trails may be assessed. Past monitoring would be used to determine problem areas that require repeated monitoring following similar events.

This type of monitoring would focus on:

- Erosion sources
- Large areas of pooled water on trails or near facilities
- Downed trees or other hazards

Following monitoring, staff document the date monitoring was conducted, the location of monitoring, the type of event that prompted monitoring, observations, and any maintenance needs. This type of monitoring is meant to be rapidly deployed as needed so that information can be quickly gathered to prioritize maintenance needs, identify hazards, and allow for preventative action from park management.

6.2.3 Monitoring Following a High-Use Weekend

Busy weekends, typically during holidays can dramatically impact the road and trail system at the SVRA. It is beneficial to monitor the road and trail system after a high use period to evaluate and respond to any resource damage and/or maintenance needs.

Park staff will opportunistically monitor areas that are prone to high use. Monitoring of this nature is more informal, but the information gathered can be useful to help prioritize maintenance needs. Staff should document the location and date of any maintenance needs observed. This type of monitoring is meant to inform and assist in prioritizing maintenance needs, safety concerns, and allow for responsive preventative maintenance from park management.

6.2.4 Post Restoration Monitoring

Following the completion of restoration projects, appropriate project specific monitoring will be determined. Monitoring may be scheduled or opportunistic depending on the project. Restoration areas will be monitored to assess how the efforts have held and for any maintenance needs. If maintenance is required, specific locations and repair needs will be recorded using ArcGIS. The information will be provided to resources and maintenance staff and repairs will be scheduled accordingly.

6.2.5 Park Boundary Monitoring

Monitoring along the park boundary between ABDSP® and OWSVRA will occur opportunistically. Downed signs along the boundary will be reported to maintenance and areas with elevated encroachment will be reported to the rangers, as well as maintenance for potential addition of signs.

6.2.6 Fence Monitoring

Opportunistic or scheduled monitoring of fences will occur throughout the park. If maintenance of barricades or fences are required, specific locations and repair needs will be recorded using ArcGIS. The information will be provided to maintenance staff and repairs will be scheduled accordingly.

7 REPORTING

An annual Soil Conservation Plan Compliance Report will be developed by the District and will contain the following elements to demonstrate compliance with the 2020 Standard: a list of maintenance activities (including restoration) performed during the previous season, results of monitoring that occurred, and a review of any development projects undertaken during the prior season. The Compliance Report will also contain an Action Plan that details soil conservation efforts to be undertaken during the upcoming year. The Compliance Report is anticipated to be completed annually in early fall.

8 CONSTRAINTS

Constraints are factors that may limit the District and/or State Parks' ability to achieve the soil conservation management and monitoring elements described in this document. While the Soil Conservation Plan was designed with potential constraints in mind, planning for every possibility is impossible. The annual Soil Conservation Plan Compliance Report would include a discussion if scheduled work did not occur in response to a constraint. Examples of constraints that may limit or alter described elements of the Soil Conservation Plan include:

8.1 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. Due to the importance of annual weather cycles at Ocotillo Wells SVRA, weather stations have been installed at the unit. The weather station allows staff to better understand current trends at the SVRA, but this understanding does not negate the challenge associated with certain weather cycles.

8.2 LEGAL OR REGULATORY OBLIGATIONS

Ocotillo Wells 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 SCP is appropriate to meet these new commitments. The decision to update a SCP outside the five-year update cycle would be determined in conjunction with OHMVRD and NRD.

8.3 OPERATIONAL LIMITATIONS

Operational limitations include financial obligations and staff capacity. These limitations may arise at any level within the state, not just from Ocotillo Wells SVRA or the District. Financial constraints may arise with competing district priorities, recessions, budget cuts, or other changes to district funding or funding sources. Depending on the scale of the financial constraint, staff will need to reprioritize efforts, which may alter capacity to meet annual targets laid out in the SCP.

As 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.

8.4 General Plan

The current Ocotillo Wells SVRA General Plan was finalized in 1982 and currently undergoing an update. The process of finalizing a general plan can take several years and there is currently no expected date for a final plan. This update may change and provide more guidance on future management of the park.

8.5 Fill Material

Fill material is used for projects or trail maintenance and repairs throughout the park. Sterile sources of fill material from outside sources are limited or difficult to obtain, transfer, and use within the park. Occasionally, material within the park will be collected from sand drifts, flash flood deposits, or rouge rock deposits from grooming activities to supplement the fill material needed.

8.6 Stochastic Events

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

8.7 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 SCP goals and objectives, rather as a sample of potential constraints that may arise. If any other constraint were to arise, it would be documented appropriately within an annual report.

9 REFERENCES

Bean, L. J. (1974). *Mukat's People: The Cahuilla Indians of Southern California.* University of California Press.

Bean, L. J., & Saubel, K. S. (1972). *Temalpakh: Cahuilla Indian Knowledge and Usage of Plants.* Malki Museum Press.

Bedrossian, T. L., Roffers, P., Hayhurst, C. A., McCrea, S., Wanish, B., & Thompson, J. (2010, July). Geologic Compilation of Quaternary Surficial Deposits in Southern California, July 2010: Compiled from Existing Sources. Sacramento, CA: California Geological Survey, 2010.

Bureau of Land Management (BLM). (2007, October). Final Environmental Impact Statement for the Truckhaven Geothermal Leasing Area. El Centro, CA: Bureau of Land Management El Centro Field Office.

Bureau of Land Management (BLM). (2008, July). Record of Decisino for the Truckhaven Geothermal Leasing Area. El Centro, CA: Bureau of Land Management El Centro Field Office.

California Department of Fish and Wildlife. (2022, 5 10). *San Felipe Creek Ecological Reserve*. Retrieved from Wildlife.ca.gov: https://wildlife.ca.gov/Lands/Places-to-Visit/San-Felipe-Creek-ER

California Department of Parks and Recreation Natural Resources Division (CDPR). (2021). Technical Memorandum: Development of State Vehicular Recreation Area (SVRA).

California Department of Parks and Recreation Off Highway Motor Vehicular Recreation Division (CDPR). (2020). 2020 Soil Conservation Standard and Guidelines.

California Department of Parks and Recreation Off-Highway Motor Vehicule Recreation Division Ocotillo Wells District (CDPR). (2017). *Updated Dust Control Plan for Ocotillo Wells and Heber Dunes State Vehicular Recreation Areas*. Imperial County, CA.

California Energy Commission. (2022). *Desert Renewable Energy Conservation Plan*. Retrieved from California Energy Commission: https://www.energy.ca.gov/programs-and-topics/programs/desert-renewable-energy-conservation-plan

California Geological Survey. (2012, February). Compilation of Geology and Surficial Deposits in Ocotillo Wells SVRA. CA: A Project for California State Parks.

California State Parks. (2016). Administrative Draft Ocotillo Wells SVRA General Plan. California: California Department of Parks and Recreation.

Cory, H. T. (1915). *The Imperial Valley and the Salton Sink.* San Francisco: John J. Newbegin.

County of Imperial. (2011). *Final Environmental Impact Report for the Salton City Landfill Expansion*. Volume I of II.

Deméré, T. A. (2012). Ocotillo Wells State Vehicular Recreation Area Paleontological Resource Assessment and Inventory. San Diego Natural History Museum, Department of Paleo Services.

Department of Parks and Recreation. (1981). *Ocotillo Wells State Vehicular Recreation Area Preliminary General Plan.* Department of Parks and Recreation.

Department of Parks and Recreation. (1986, July). *Ocotillo Wells East Acquisition Final Environmental Impact Report*. CA: California Department of Parks and Recreation.

Department of Parks and Recreation. (2007). Draft Ocotillo Wells Section G Report 2006/2007. Borrego Springs, CA.

Department of Planning and Land Use. (2011, August). *San Diego County General Plan Update Final Environmental Impact Report*. San Diego County, CA: County of San Diego.

Erickson, E., Mickel, A. E., & Rolloff, D. B. (2014, August). *California Department of Parks & Recreation Off-Highway Motor Vehicle Recreation Division Attendance Study 2012-2013*. Sacramento, CA: Report prepared for California State Parks Off-Highway Motor Vehicle Recreation Divsion by California State University Sacramento Department of Recreation, Parks, and Tourism Administration. Retrieved from https://ohv.parks.ca.gov/pages/25010/files/ohmvr-attendance-study-report-2014.pdf

Fitzpatrick, A. (2011). *The Search for "Black Gold" at Ocotillo Wells SVRA: A History of Oil Exploration*. Borrego Springs, CA: CA Department of Parks and Recreation, Ocotillo Wells District.

Imperial County Air Pollution Control District (ICAPCD). (2018). *Staff Report: Imperial County 2018 Redesignation and Maintenance Plan for Particulate Matter Less than 10 Microns in Diameter (2018 PM10 Plan).* Imperial County Air Pollution Control District.

Johnson, H. B., Vasek, F. C., & Yonkers, T. (1975). Productivity, Diversity and Stability Relationships in Mojave Desert Roadside Vegetation. *Bulletin of the Torrey Botanical Club*, 106-115.

Kennan, G. (1917). *The Salton Sea: An Account of Harriman's Fight with the Colorado River.* Macmillan.

Kress, et al. (2011). DPR 523 Archaeological Site Record. *CA-SDI-00443 Barrel Springs, Update 2011*. Borrego Springs, CA: California Department of Parks and Recreation, Ocotillo Wells District.

Laylander, D. (1995). The Chronology of Lake Cahuilla's Final Stand. *Society of California Archaeology, 8*, 69-78.

Minnick, J. (2015, October 6). Renewable Energy and Transmission Element. *County of Imperial General Plan*. El Centro, CA: Prepared by Imperial County Planning and Development Services Department.

Parker, J. (2011). DPR 523 Archaeological Site Record. *P-37-032116/CA-SDI-20350 Toner Homestead and Turkey Ranch*. Borrego Springs, CA: California Department of Parks and Recreation, Ocotillo Wells District.

Reed, L. (1963). *Old Time Cattlemen and Other Pioneers of the Anza-Borrego Area.* Desert Printers.

Snyder, C. T., Frickel, D. G., Hadley, R. F., & Miller, R. F. (1976). *Effects of Off-Road Vehicle Use on the Hydrology and Landscape of Arid Environments in Central and Southern California.* U.S. Geological Survey.

Switalski, A. (2018). Off-highway Vehicule Recreation in Drylands: A Literature Review and Recommendations for Best Management Practices. *Journal of Outdoor Recreation and Tourism, 21*, 87-96. doi:https://doi.org/10.1016/j.jort.2018.01.001

Taylor, M. (2018, August 29). The Salton Sea: A Status Update. Legislative Analyst's Office.

Tetra Tech, Inc. (2013, September). *Dust Control Plan for Ocotillo Wells and Heber Dunes State Vehicular Recreation Areas*. CA, Imperial County: Prepared for California Department of Parks and Recreation Off Highway Motor Vehicular Division, Ocotillo Wells District by Tetra Tech, Inc.

Torres Martinez Desert Cahuilla Indians. (n.d.). *About TMDCI*. Retrieved from torresmartinez.org: http://torresmartinez.org/about/

U.S. Bureau of Land Management (BLM). (2007). Final Environmental Impact Statement for Truckhaven Geothermal Leasing Area.

U.S. Bureau of Land Management and California Department of Parks and Recreation (BLM and DPR). (2008, September). Memorandum of Understanding between U.S. Department of the Interior and California Department of Parks and Recreation.

United States Department of Agriculture (USDA). (1973, December). *Soil Survey San Diego Area, California, Part I*.

United States Environmental Protection Agency (EPA). (2010). *State and County Emission Summaries*.

United States Environmental Protection Agency (EPA). (2020). *PM10: A Rule by the Enironmental Protection Agency on 09/18/2020*. Federal Register. Retrieved from https://www.federalregister.gov/documents/2020/09/18/2020-18427/pm10

United States Geological Survey (USGS). (2011). *Diagram of Channel Cross Section with Subsections*. Retrieved from https://www.usgs.gov/media/images/diagram-channel-cross-section-subsections

Vasek, F. C., Johnson, H. B., & Brum, G. D. (1975). Effects of the Power Transmission Lines on Vegetation of the Mojave Desert. *Madroño, 23*, 114-130.

White, E. S., & Roth, B. J. (2003). Fish Traps on Ancient Shores: Exploring the Function of Lake Cahuilla Fish Traps. *Journal of California and Great Basin Anthropology, 29*(2), 183-193.

10 APPENDIX 1: 2012 CALIFORNIA GEOLOGICAL SURVEY STUDY OF THE GEOLOGY AND SOILS OF OCOTILLO WELLS SVRA

At the request of DPR OHMVRD, the CGS compiled a 1:24,000 scale geological map of OWSVRA as a basis for understanding the underlying geology and soils within the SVRA and to assist with general planning issues on a regional scale. Soil samples were used in analyzing grain size variations and in refining the boundaries of the variations and the various geologic units.

The study found that OWSVRA contains numerous Quaternary surficial deposits (less than 2.6 million years) on alluvial fans and floodplains. In general, areas of most recent deposition during Late Holocene time (within the last 500 years) have a greater potential to be areas of future flooding and deposition than those areas where older surficial deposits are exposed. Quaternary surficial deposits were defined using the nomenclature developed by CGS for mapping Quaternary surficial deposits in southern California for the California Department of Water Resources and the state's Alluvial Fan Task Force (Bedrossian, et al., 2010).

10.1 QUATERNARY SURFICIAL DEPOSITS

Quaternary surficial deposits found within OWSVRA fall into seven time periods and 16 geological units. Below lists the geological units found at OWSVRA based on geologic time, organized youngest to oldest.

10.1.1 Late Holocene (Present – 11,700 years ago)

- Alluvial Wash Deposits – unconsolidated sandy and gravelly sediment deposited in recently active channels of streams and rivers; may contain loose to moderately loose sand and silty sand.
- Alluvial Fan Deposits – unconsolidated boulders, cobbles, gravel, sand, and silt recently deposited where a river or stream issues from a confined valley or canyon; sediment typically deposited in a fan-shaped cone; gravelly sediment generally more dominant than sandy sediment.
- Alluvial Valley Deposits – unconsolidated clay, silt, sand, and gravel recently deposited parallel to localized stream valleys and/ or spread more regionally onto alluvial flats of larger river valleys, sandy sediment generally more dominant than gravelly sediment.
- Terrace Deposits – lake, stream, and river terrace deposits consisting of unconsolidated thin – to – thick-bedded silt to boulder size deposits; may be locally undifferentiated from Alluvial Valley Deposits.
- Lacustrine and Playa Deposits – mostly unconsolidated fine-grained sand, silt, mud, and clay from fresh water (lacustrine) lakes and saline (playa) dry lakes and are periodically flooded; includes thin series of tan and gray fossiliferous clay, silt, sand, and gravel deposited in former Lake Cahuilla; deposits may contain salt and other evaporates.

- Eolian and Dune Deposits – unconsolidated, generally well-sorted, wind-blown sand; ranges from thin veneers to larger dunes.

10.1.2 Holocene to Late Pleistocene (11,700 – 126,000 years ago)

- Young Alluvial Fan Deposits – unconsolidated to slightly consolidated, undissected to slightly dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon; in northern part of area, deposits are mainly medium to coarse grained sand and medium grained gravel; may have well developed desert pavement and desert varnish.

10.1.3 Late to Middle Pleistocene (0.126 – 0.78 million years ago (Ma))

- Old Alluvial Fan Deposits – slightly to moderately consolidated, moderately dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon.
- Old Alluvial Valley Deposits – slightly to moderately consolidated, moderately dissected clay, silt, sand and gravel along streams valleys and alluvial flats of larger rivers, isolated terraces, and abandoned channels.

10.1.4 Early Pleistocene to Late Pliocene (0.78 – 2.6 Ma)

- Brawley Formation – light gray claystone, sandstone, and pebble gravels largely of lacustrine origin; grades laterally into Ocotillo Conglomerate.
- Ocotillo Conglomerate – massive, non-marine, gray, granitic boulder to cobble conglomerate; grades into bedded pebble conglomerate with occasional pink sandstone and clays.

10.1.5 Late to Middle Pliocene (2.6 – 3.6 Ma)

- Borrego Formation – non-marine, gray claystone, and interbedded sandstone of lacustrine origin; fossiliferous; contains local lenses of sodium sulfate.
- Palm Springs Formation – Pink to greenish gray to buff, non-marine arkosic sandstone and interbedded red clay; includes fossil hardwoods (mesquite) and calcareous concretions; grades laterally into Canebrake Conglomerate and Ocotillo Conglomerate
- Canebreak Conglomerate – light gray to gray cobble conglomerate; granitic to gneissic detritus; forms coarse marginal facies of Palm Springs Formation.

10.1.6 Middle Pliocene to Early Miocene (3.6 – 23.7 Ma)

- Imperial Formation – marine sequence of light yellow to gray and buff, consolidated clay shale and claystone; interbedded with arkosic sandstone, dark brown oyster shell reefs, and fossiliferous calcareous sandstone; friable, hard, fractures conchoidally; weathers to yellowish gray clay soil.

10.1.7 Pre-Tertiary (Older than 66.4 Ma)

- Granitic and other intrusive crystalline rocks of all ages; includes quartz diorite, gabbro, and tonalite.

11 APPENDIX 2: DISTRICT TRAIL TERMINOLOGY

The District has developed standardized terminology of trail features, which allows staff from various classifications and backgrounds to have consistency when discussing trail maintenance. Below are the terms as defined by Ocotillo Wells District staff.

Working Area/Maintenance Corridor (Corridor): The area of which maintenance work will occur. Typically contains the area from the outside of one berm to the outside of the other berm. When hillsides or other features are present, the working area may be limited.

Embankment: Natural features, such as a hill or other landscape feature, that extend above the trail. As these features exist naturally, rather than due to maintenance or mechanical reasons, work may not extend beyond any berms that exist. If a berm is not present, the hinge points of the trail are the extent of the maintenance corridor.

Tread (Bench): The portion of trail where driving is to occur or intended to occur. While the District uses these terms interchangeably, the tread is a subset of the bench. The bench refers to inside of berm to inside berm while tread refers to the center of the trail where driving tends to occur.

Crowned: A tread shape where the center of the tread is raised to allow water to disperse to either side of the trail.

Hinge Point: Bending point of trail between tread and berm.

Shoulder: The area for accommodating vehicles without disturbing traffic in the corridor. This could be two feet outside of the corridor. If the trail is low-lying, it could be the berms on either side of the trail.

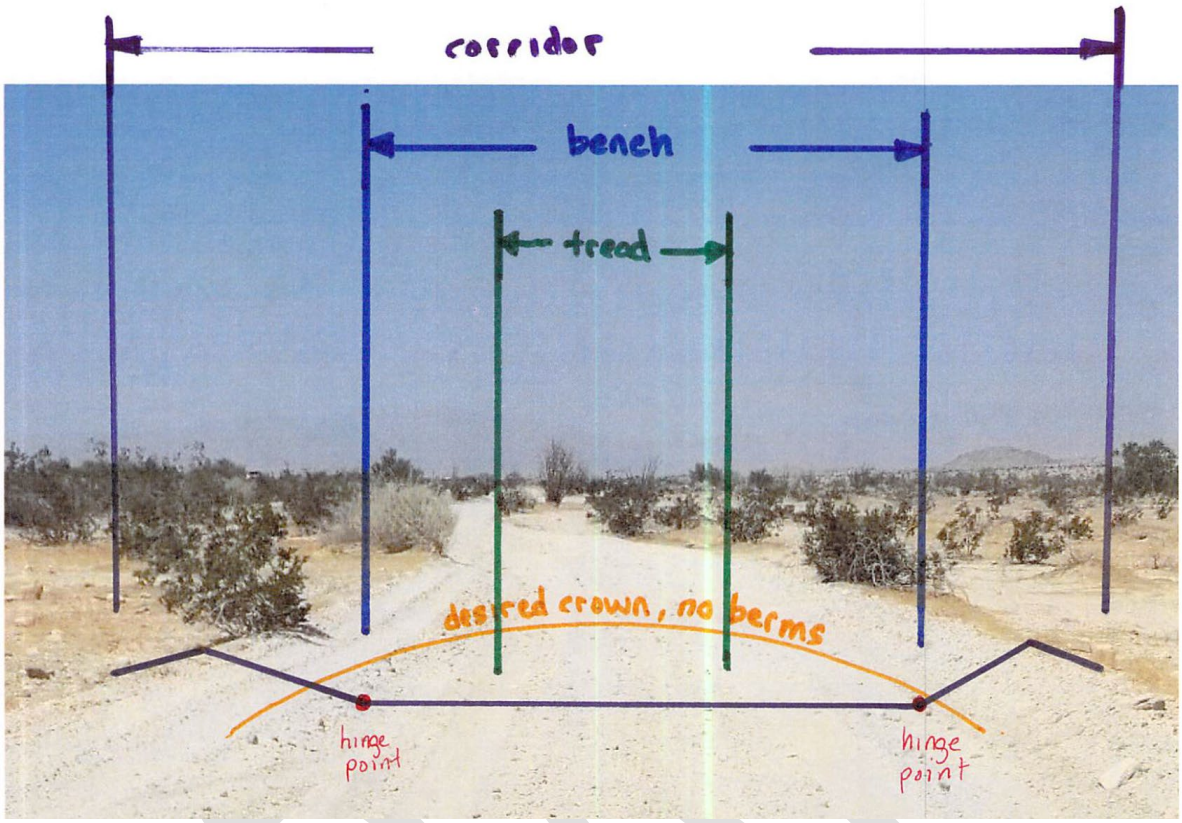


Figure 13. Trail definitions example.

12 APPENDIX 3: VETERANS PASS MAINTENANCE

Veterans Pass partially follows a historic era trail from WWII. The historic trail, referred to as Military Dump Road (MDR) in site records at the District, is associated with the WWII rocket target areas Winona I and II. MDR is marked on USGS Quadrangle maps as being a Jeep Trail.

Veterans Pass trail was created in the early 2000's after Ocotillo Wells SVRA purchased additional land to the north of existing park boundaries. The trail is roughly three miles long, following a generally straight east to west orientation. Veterans Pass is utilized recreationally by park visitors and as a means of transit by maintenance to reach facilities at Pumpkin Patch. Veterans Pass trail overlaps the historic MDR trail for roughly a mile. To protect the historic trail, specific guidelines regarding maintenance of Veterans Pass trail can be found below (Figure 14).

Veterans Pass Maintenance Guidelines:

1. Historic portions of the trail should be maintained to no wider than 10 feet to keep the original feel of the jeep trail and avoid impacting vegetation or artifacts beyond the trail. To maintain this width, a dozer or skid steer may be used rather than the District's standard grader.
2. Non historic portions can be maintained at 12 feet wide.
3. Berms should be kept low by setting the grader blade at a 45 degree or greater angle, which allows operator to gather materials from existing berms and push the soils into the trail. This will additionally keep the trail from becoming entrenched.
4. Work shall be completed on an annual basis and will be scheduled with the District Archaeologist. Any additional grooming should be reviewed by the District Archaeologist prior to work beginning.

Figure 14. Veterans Pass maintenance monitoring sections.

13 APPENDIX 4: 4X4 AREA MU OBSTACLE MAINTENANCE

Features within the 4x4 obstacle area require regular maintenance. Hill climbs such as *Get-Er-Done Gulch* are maintained in a similar fashion as larger hill climbs within the 4x4 Area MU. Material at the base of the hill is pushed up the hill using heavy equipment. Water is used to wet the soils which is then compacted by heavy equipment.

Many of the features require sand removal from fine wind-blown sands that get trapped within the obstacles. *Log Jam*, *Lil' Rubicon*, and *Leftovers* are obstacles which are usually in need of this maintenance. Sand removal, using hand crews, is needed when the rings fill in with fine sediment sand. Shovels are generally used to remove the sand from the 4x4 structure into buckets. The sand is then placed in an area for the SPEO to move the sand near the fence line on the eastern side or spread out in the nearby area, where the material would have naturally blown towards. Rocks, logs or any other obstacle features that may have moved from activity are put back into place by SPEO. In some cases, heavy equipment is used to lift the features and reset them on top of the wind-blown sand. Historically, a trailer mounted high-powered vacuum has been used to remove sand from these obstacles. Small generators powering industrial shop vacs have also been used when sand loads are not as substantial.

Tank Trap, *Game of Life*, *Shoots and Ladders*, *Dollar Drop*, *Lizard Lair*, and *Rocker Knocker* can fill with windblown sand between rocks or within the 4x4 obstacle. Hand crews or heavy equipment are used to remove sand and place it where it would have naturally blown towards. Water may be used to wash out loose sand to expose concrete in *Rocker Knocker*. A skid steer or hand tools is used to remove sand. Maintenance is completed as needed.

Lil' Twister requires maintenance every couple of years when hills have become eroded. Maintenance of this feature is performed by heavy equipment by breaking up the hills, resetting hummocks, and compacting. Water is used to wet the material prior for cohesion and compaction. Previously, the hills would be built up by shoveling material from between each hummock, bringing the material to the top of each mound, and compaction was done by hand tools and gas-powered tampers.

Lil' Wuppdido are exaggerated whoops about three to four feet in height. Maintenance occurs when the whoops have degraded or eroded. The 4x4 feature is lightly wetted prior to maintenance occurring. Using heavy equipment, material within the lower section of the whoops is pulled up to the top and recompacted with the weight of equipment.

Flex Test, *Gate Keeper*, *Thousand Dollar Hill*, *Crossover Peak*, *Bo's Bowl*, *Get Tired*, and *Lil' Sluice* have concrete footing that can occasionally be exposed. Heavy equipment is used to smooth out soil to cover the base of the obstacle and any exposed edges. A grader may be used to smooth out the area. Occasional minor crack repairs in concrete are performed by hand tools and the placement of additional concrete or mortar as needed.

KCHP is a mix of tires and concrete tubes. Occasionally tires are thrown out of place due to 4x4 activity and need replacing. A backhoe is used to dig a pocket for the tire to be replaced and then filled with soil again. *Tubular* occasionally requires soil to be moved back to either side of the obstacle. After each maintenance activity, a water cannon is used to spray down the obstacles to allow for soil to settle into place.

14 APPENDIX 5: PROJECTS

In addition to routine maintenance discussed in Section 3 of this document, additional projects occur throughout the park for various needs. Below is a list of projects approved within the last five years. While this list is not inclusive of all the work conducted within Ocotillo Wells SVRA, it highlights some non-routine maintenance and management focuses within that time. These projects have been environmentally reviewed pursuant to the California Environmental Quality Act.

Year	Project Name	MU
2018	Auto Shop Expansion Project	HQ Area
2018	Benson Lake Loop CXT Concrete Pad Project	Open
2018	Discovery Center Low Wattage Powerline	HQ Area
2018	Emergency Road Repairs - Poleline Road	East of Poleline
2018	Holmes Camp Water System Upgrade	Open
2018	Poleline Road CXT Parking Apron Replacement	Open
2018	Pressure Tank Building Water System Upgrade	HQ Area
2018	Toner Gate Modification	Open
2018	Truckhaven Palms - Bowl Restoration	Truckhaven
2018	Truckhaven Signage	Truckhaven
2019	Emergency Repairs - Poleline Road	East of Poleline
2019	Holmes Camp Fire Rings and Ramada Replacement	Open
2019	Main St. Event Center Creosote	Open
2019	Main St. Event Center Irrigation	Open
2019	OW Mud Pot - Artesian Water Source Enclosure	East of Poleline
2019	Pitfall Array Removal - AL1 and SR1	Open
2020	Barrel Springs Fence Expansion	Barrel Springs
2020	Desert Ironwood Filled Donut	HQ Area
2020	Poleline x Gas Domes CXT Parking Apron Replacement	Open
2020	Toner Improvements	Open
2020	Truckhaven HMS Plots & Pitfall Array Installation	Truckhaven
2020	Truckhaven Palms - Flats Restoration	Truckhaven
2021	Burrtec Temporary Waterline at Salton City Landfill ROE	East of Poleline
2021	Cahuilla x Roadrunner Resource Fencing	Open
2021	Catshead Restoration	Catshead
2021	District Office Irrigation Improvements	HQ Area
2021	Emergency OW HQ Septic Replacement	HQ Area
2021	Toner Gate Modifcation West Gate	Open
2021	Toner Housing Fence	Open
2021	Toner Satellite Internet Installation	Open
2021	Truckhaven Geothermal Seismic Study (ROE)	East of Poleline, Northern Washes, Truckhaven

Year	Project Name	MU
2022	Notches Sign Stanchions	Truckhaven
2022	Donut Fill Restoration and Recurring Maintenance	HQ Area, Open
2023	IID Emergency Power Line Repair Staging Area	East of Poleline, Northern Washes, Open
2023	Ocotillo Wells Dust Control	HQ Area, Open, 4x4
2023	Vehicle Solar Charging Station	HQ Area

15 Appendix 6: Monitoring Methodology

This appendix details the different types of monitoring, including performance indicators and methodology, that will occur to assess SCP objectives. These 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. Updates on baseline, targets, and metrics will be as well as any changes to monitoring will be addressed in future SCP annual reports and updates.

15.1 Trail Assessments

15.1.1 Performance Indicator(s)

15.1.1.1 Description

Manage Ocotillo Wells SVRA soil resources for sustainable long-term (25 years) prescribed use without exceeding restorability of soil loss and without causing erosion or sedimentation that significantly affects resource values beyond the facilities.

15.1.1.2 Expectation

Determine compliance with the 2020 Soil Conservation Standard by assessing OHV recreational facilities at the unit that could contribute to soil loss, erosion, or sedimentation.

15.1.1.3 Metric(s)

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

1. Number of acres throughout the unit that are treated or closed and passively restored.
2. Condition, location, and extent of trails monitored or treated for erosion, sedimentation, or other related impacts.

15.1.1.4 Baseline

To be developed by 2029. Data collection is anticipated to begin in 2024. Early efforts will be focused on gathering data, finalizing assessment methods, and identifying areas of concern. All trails within OWSVRA will not be surveyed within a year span. A rotational cycle will occur with high use trails surveyed once a year. As monitoring begins, baseline can be established for individual trails that have been surveyed and will be reported in the SCP reports. All trails are expected to be surveyed by 2029.

15.1.1.5 Target(s)

To be established by 2029. Generally, targets aim to identify and reduce sources of soil loss, sedimentation, and erosion at Ocotillo Wells SVRA.

1. By 2029, establish baseline conditions of soil resources and facilities within the unit as they relate to the 2020 Soil Conservation Standard.
2. By 2029, identify and implement restoration of facilities within the SVRA that significantly contribute to erosion, soil loss, and sedimentation.

These targets will be refined to be quantitative after baseline is established in 2029 and will be discussed in the annual Soil Conservation Plan Report.

15.1.1.6 Basis for Selection

Managing Ocotillo Wells SVRA's soil resources for sustainable long-term prescribed use is an important component of PRC §5090.35. Additionally, OHMVRD's 2020 Soil Conservation Standard and Guidelines are a requirement of the SVRA as an OHV facility. Annual maintenance, inspection, and repairs will be critical elements of meeting soil conservation objectives at the unit.

Primary management focus at Ocotillo Wells SVRA is to ensure trails meet the 2020 Standard. Annual maintenance and assessments of mapped trails will ensure facilities are operating and functioning as intended to protect soil resources at the unit. Monitoring will be scheduled appropriately for the large unit size, through a rotating cycle with high use trails monitored annually.

15.1.2 Methodology

A trail assessment protocol was developed in early 2023 based on the 2020 Soil Conservation Standard and Guidelines Appendix 3. Modifications were made to allow metrics to better match the needs at Ocotillo Wells SVRA with focus on mapped trails outside of washes. Assessments of the entire park's road and trail system will not occur within a single year. High use trails, such as Poleline Road, Shell Reef Expressway, and Gas Domes Trail, will be assessed annually while the remaining trails will be assessed on a rotating cycle over a five-year period.

Trail assessments will rate individual trails based on eight trail conditions, tread, trail width, trail depth, berms, sand drift, off-trail travel in open ride areas, off-trail travel in trails only areas, and intersection tread slope. Each trail condition will be rated either a green, yellow, or red which will provide a number score of 1, 2, or 3, respectively. Trail conditions number scores are to be averaged to provide an overall score for each trail. The overall score will inform maintenance needs and contribute to the development of the annual maintenance plan. The trail assessment protocol can be found in Appendix 7 Trail Assessment Instructions & Datasheets.

15.1.3 Program Risks and Uncertainties

While the SVRA can control property within the State-owned lands within the boundary, ownership, or land management changes to within the boundary or adjacent property may result in future impacts to SVRA soil resources.

Assessments will only capture the conditions at the time of monitoring. It is possible for trail conditions to have changed thereafter. Weather or stochastic events can rapidly change conditions throughout the park. While there is informal monitoring to attempt to capture that data quickly, these formal assessments will be slower.

15.2 WASH ASSESSMENTS

15.2.1 Performance Indicator(s)

15.2.1.1 Description

Reduce off trail and soil disturbance along designated trails within washes at Ocotillo Wells SVRA.

15.2.1.2 Expectation

Manage designated trails within washes at the unit that could contribute to off trail soil loss, erosion, or sedimentation.

15.2.1.3 Metric(s)

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

1. Condition, location, and extent of trails within washes monitored or treated for erosion, sedimentation, or other related impacts.
2. Number of acres and miles throughout the unit that are restored.
3. Acres, miles, and location restored through the Catshead Rehabilitation Project.

15.2.1.4 Baseline

To be developed by 2028. Data collection is anticipated to begin in 2026. Early efforts will be focused on gathering data, finalizing assessment methods, and identifying areas of concern. As monitoring begins, baseline can be established for individual washes that have been surveyed and will be reported in the SCP reports. All trails within washes are expected to be surveyed by 2028.

During the 2021 restoration season, roughly 2.25 acres and 6.7 miles of volunteer trails were treated up to 50 meters or to line of sight from mapped trails. While this data will assist with defining baseline, additional years of restoration efforts and monitoring will be needed.

15.2.1.5 Target(s)

To be established by 2028. Generally, targets aim to identify and reduce off-trial activity within the Catshead MU. More specific targets will be developed once baseline is established.

1. Through 2029, reduce off trail disturbance and maintain mapped trail corridors within the Catshead MU.
2. By 2028, establish baseline conditions of off trail disturbance within the Catshead MU.

15.2.1.6 Basis for Selection

Many large washes within the park are mapped as trails within OWSVRA. Unlike the trails outside of washes, there is no usual or routine maintenance that occurs for the trails within washes. The washes have a high disturbance cycle through flash flooding events and depending on the intensity and shape of the wash, a portion or the entire wash could flow. These events often wash away OHV tracks and in some cases the trail path may be altered. Following flooding activity, the trails are redefined, generally following the lowest point within the wash. Depending on the type of wash, wash walls or vegetation can help assist delineate trails.

Vegetation plays a key role in OWSVRA, aside from being a visual cue to maintain riding corridors, it helps in soil retention and reducing erosivity (Castillo et al., 1997). Additionally, it is an important component of any habitat and is often considered when assessing habitat condition and health. As vegetation is very limited in OWSVRA, it is important to conserve the present vegetation as they are vital in conserving soil.

OHV activity can have direct impacts to vegetation by physically damaging vegetation through riding activities and compaction of soils which can affect the soils' ability to support vegetation. To minimize impacts from anthropogenic sources to vegetation best management practices identified by Switalski (2018) suggests trails should be clearly signed and delineated and monitored for user-created routes into areas with sensitive vegetation would occur.

Within the unit, Catshead MU has majority of the trails within broad washes and has the highest density of vegetation allowing for the highest chance for restorability. With the help of intermittent flooding activities, volunteer OHV tracks may be erased. These events in conjunction with the Catshead Rehabilitation project can help to encourage riders to stay on trail and manage off trail travel within the MU. Additionally, Catshead is currently designated as open ride but with upcoming changes to the general plan management practices may change in the future. Tracking the changes is important to help identify future management goals and practices.

15.2.2 Methodology

To be established by 2025. Survey methodology for wash assessments will be established in the first year of the SCP as it is finalized and implemented. Broadly, this assessment will be a subset

of the trails assessments which will be modified from the trail assessment example in Appendix 3 of the 2020 Soil Conservation Standards and Guidelines. Testing of the trail assessment protocol began in 2022. Wash assessment will largely focus on identifying ingress and egress of volunteer trails from designated trails to manage for off trail disturbance. The protocol will be appended to the annual SCP report.

15.2.3 Program Risks and Uncertainties

As methodologies are tested, changes may be made as different methodologies and techniques are incorporated. Changes made will be included within the annual SCP reporting process.

Assessments will only capture the conditions at the time of monitoring. It is possible for wash conditions to have changed thereafter. Weather or flash flooding events can make rapid large scale changes to the landscape. While there is informal monitoring to attempt to capture that data quickly, these formal assessments will be slower.

Between the years, restoration needs will vary depending on the conditions. Resets to the trails from flooding events can change the focus of restoration needs and cause challenges with tracking as these events can restart the count on off trail disturbances.

While the SVRA can control property within the SVRA-owned lands within the boundary, land management changes to adjacent property may result in future impacts to SVRA soil resources.

15.3 Truckhaven Baseline

15.3.1 Performance Indicator(s)

15.3.1.1 Description

Manage social trails and erosional features on DPR-owned lands within the Truckhaven MU.

15.3.1.2 Expectation

Assess erosional features within the Truckhaven MU that may contribute to soil loss, erosion, or sedimentation.

15.3.1.3 Metric(s)

To be established by 2026. Data collection is anticipated to begin by 2026. In the first year of monitoring efforts will be focused on testing and determining the monitoring method. Metrics will be determined once monitoring has been defined. Generally, metrics will relate to change of erosion rates over time and will be updated and evaluated annually as part of the SCP Report to OHMVRD.

15.3.1.4 Baseline

To be developed by 2029. Early efforts will be focused on gathering information, refining survey methodology, analyzing results, and identifying potential metrics and performance indicators. This information will be reflected through the annual SCP reporting process. The information gathered will be used to establish baseline, from which a more refined target can be identified. As monitoring begins, baseline can be established for individual trails or erosional feature that have been surveyed and will be reported in the SCP reports. All trails and erosional features are expected to be surveyed by 2029.

15.3.1.5 Target(s)

Truckhaven wide targets to be established by 2029 following the establishment of baseline conditions. As the inventory is conducted, targets will be defined for individual areas and trails. Generally, targets will focus on the number and conditions of hill climbs within the Truckhaven MU. More specific targets will be developed once baseline is established and reported within the annual report.

15.3.1.6 Basis for Selection

The Truckhaven MU was the most recent large land acquisition within the SVRA. Prior to the acquisition, the area was popular for OHV riding, particularly with Jeeps. Designated routes were not present which resulted in social trails created throughout the area. Currently, the main large washes within the MU - Anza Ditch, Coral Wash, Palm Wash and Grave Wash - along with Truckhaven Trail (portions of which are historic) have been mapped as trails. Additional social trails and features have not been mapped.

As social trails are not specifically engineered for trail riding, erosional features along these routes can develop. Through general observation, the most notable feature within the MU are hill climbs. Hill climbs within the area usually begin at the base of a tall feature and climb directly up a cliffside or hill. According to Snyder (1976), in arid environments, active hill climbs can possibly have up to 0.3 m of erosion in a two-year period. As these features have high erosional potential, hill climbs have been identified as erosional features of interest for monitoring.

Currently, there is minimal maintenance activity within the MU. To better inform maintenance needs, an inventory of the erosional features, beginning with hill climbs, within DPR-owned lands of the MU is to be compiled. Data informing the quantity, locations, and conditions of erosional features in the MU will also assist in determining if there are specific areas to monitor more closely in the future.

15.3.2 Methodology

To be established by 2025. Survey methodology for erosion features will be established in the first year of the SCP. Broadly, assessment measures will assess erosion features such as hill climbs and concentrated use areas with hill climbs within DPR owned lands as the primary focus within this first iteration. Locations of these features will be recorded and conditions will be assessed. The assessment will utilize aspects of Appendix 3 of the 2020 Soil Conservation Standards and Guidelines to assess the conditions of the hill climbs. The protocol will be appended to the annual SCP report.

15.3.3 Program Risks and Uncertainties

An inventory of all erosional features within the MU will not be captured within a single year. Efforts will take several years to complete a full inventory. During inventory efforts, it is possible for conditions of recorded features to have changed. Assessments will only capture the conditions at the time of monitoring.

The inventory will strive to capture all erosional features within DPR-owned land, however some may prove problematic to reach depending on the location. Additionally, due to checkerboard ownership within the MU, not all features within the MU will be monitored as only features within DPR-owned lands are to be assessed. Those features may have erosion problems or could be features of interest as well.

As methodologies are tested, changes may be made as different methodologies and techniques are incorporated. Changes made will be included within the annual SCP reporting process.

15.4 Concentrated Use Area Assessment

15.4.1 Performance Indicator(s)

15.4.1.1 Description

Manage soil disturbance within the open ride area of Ocotillo Wells SVRA.

15.4.1.2 Expectation

Maintain high disturbance use within concentrated use areas.

15.4.1.3 Metric(s)

To be established by 2026. Over the first iteration of this document, efforts will be focused on testing and determining the monitoring method. Metrics will be determined once monitoring has been defined. Generally, metrics will relate to the level of activity within transition zones over time.

15.4.1.4 Baseline

To be developed by 2027. Data collection is anticipated to begin by 2026. Early efforts will be focused on gathering information, refining survey methodology, analyzing results, and identifying potential metrics and performance indicators. Once methodology is defined, monitoring will occur annually with areas of interest monitored on a rotating cycle. The information gathered will be used to establish baseline, which will be reflected through the annual SCP reporting process. As monitoring begins, baseline will be determined for each concentrated use area that have been surveyed. All concentrated use areas are expected to be surveyed once by 2027.

15.4.1.5 Target(s)

To be established by 2027. Generally, targets aim to identify changes in use within transition zone and indicate if there is a need for maintenance. More specific targets will be developed once baseline is established.

15.4.1.6 Basis for Selection

A large section, 60,024 acres of Ocotillo Wells SVRA is designated as open riding. While the management focus is on the open ride sections of the park, it is difficult to manage the large acreage to an equal level, therefore focus will be made on areas with the highest density of OHV usage such as concentrated use areas, staging areas, and camping areas.

Currently, there are four concentrated use areas located at Blowsand Hill, Mat Puy Nah Achhuukaayp (Devil's Slide), Shell Reef, and the 4x4 obstacle and Crossover areas. Staging areas are largely within the Open MU and 4x4 Area MU. Popular camping areas within the park can be found at Main Street, Quarry Road, Holmes Camp, Hidden Valley Camp, Holly Road, and Crossover Camp. Generally, gathering and camping activities are higher around these developed camp areas as facilities are available.

With the higher concentrations of anthropogenic activity at these locations, there is a potential to impact soils. Surrounding the concentrated use areas are transition zones where riding activity natural dwindles from higher use. Once out of the transition zones riding activity should generally be dispersed. Depending on activity levels, these transition zones and concentrated use areas have the potential to expand and contract over time.

Best management practices defined by Switalski (2018) state that play areas in arid environments should be in naturally barren areas that are monitored for excessive erosion in the area and adaptively manage. Data collection will better inform maintenance needs as monitoring of the concentrated use areas will show the expansion and contraction of these areas.

15.4.2 Methodology

To be established by 2025. Broadly, assessments will use areal imagery to measure the extent of disturbance within transition zones. The protocol will be appended to the annual SCP report.

15.4.3 Program Risks and Uncertainties

Monitoring through aerial imagery will provide a snapshot of conditions. These snapshots can be compared to show track changes over time but will not provide current conditions as they are on the ground.

As methodologies are tested, changes may be made as different methodologies and techniques are incorporated. Changes made will be included within the annual SCP reporting process.

16 APPENDIX 7: TRAIL ASSESSMENT INSTRUCTIONS & DATASHEET

Form Header Information

Trail Name – Enter the name of the trail that will be evaluated. Different segments of the same trail should be recorded on separate data sheets.

Trail Score – This will be the overall score for the entire trail. Average the overall scores for all the sections evaluated. The average of these scores will be the trail score.

Trail Rating – The trail rating will be determined based on the Trail Score. Trail rating will be a G (Green), Y (Yellow), or R (Red). Green will have a score between 1 – 1.9. Yellow is between 2 – 2.5. Red is between 2.5 – 3.

Rated By – Enter all names of those participating in the evaluation.

Date – Enter the date the assessment is taking place.

Site Characteristic/ Trail Description – Give generic description of the trail and soil-related conditions that exist after the assessment has been completed for the trail. Indicate if there are specific areas that may need maintenance attention. **[**Example: Course sandy material with hard pack underneath with no berms, trail generally entrenched and relatively even with slight slope. No significant issues along trail.**]**

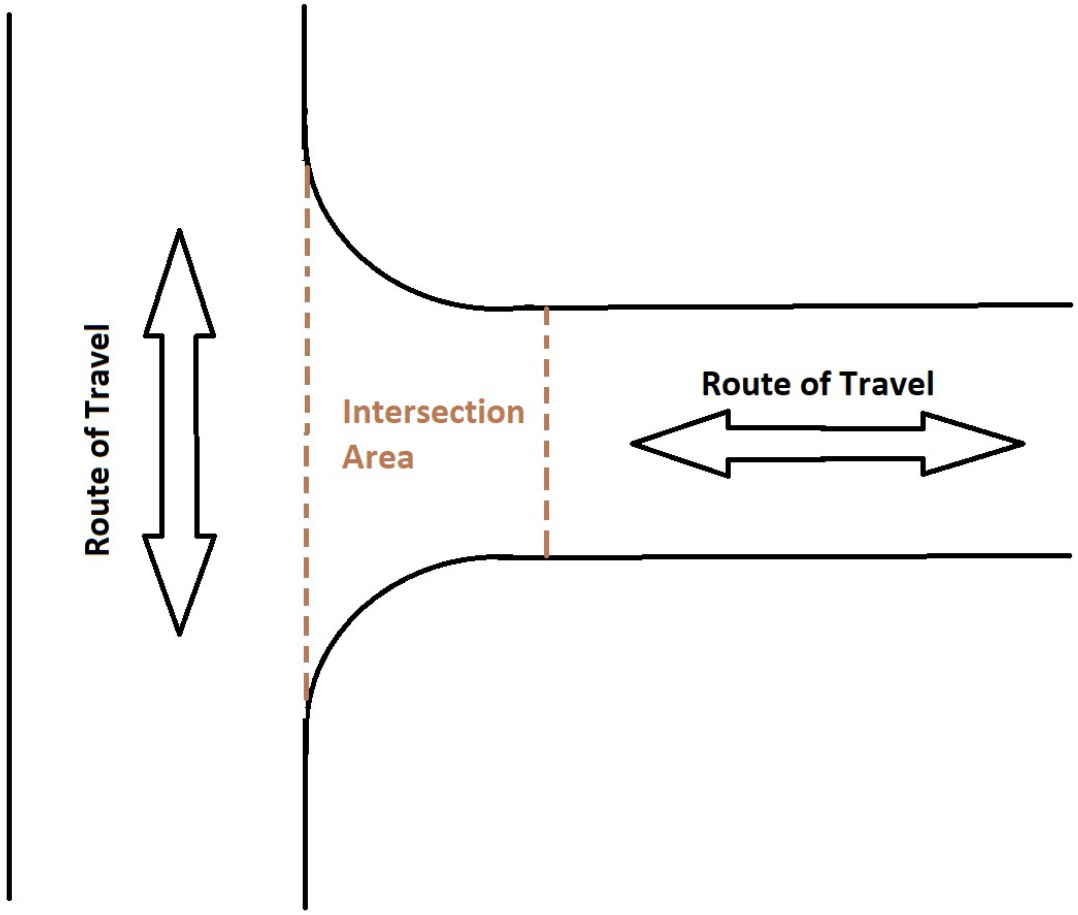
Form Body Information

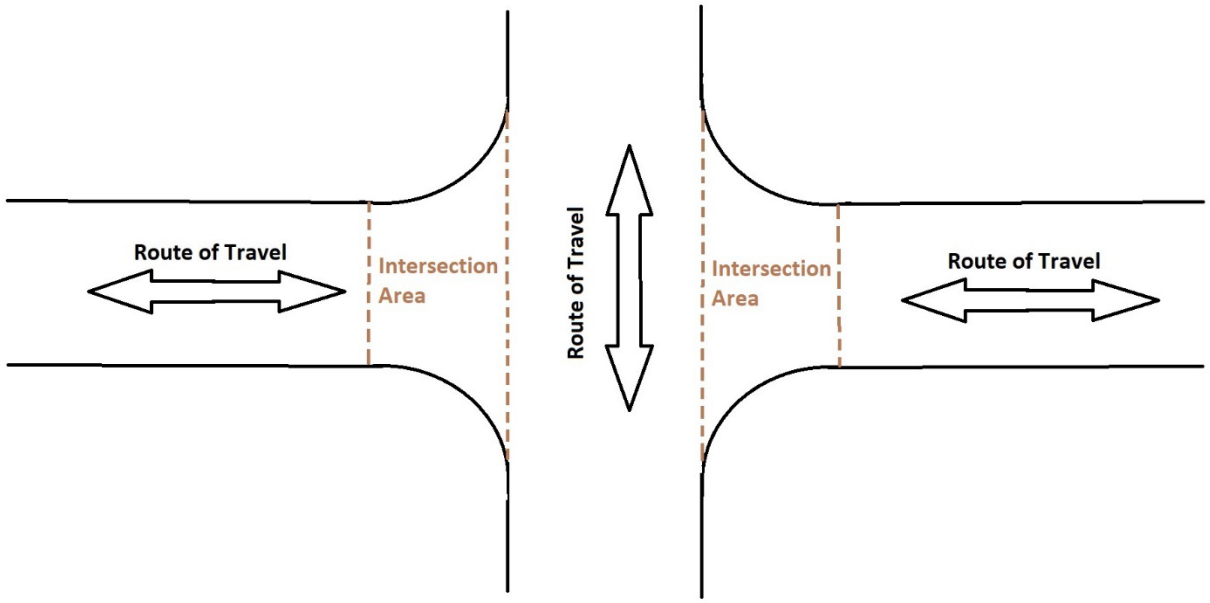
Section; Begin / End – Portions of the trail that have similar conditions or features (i.e. a trail washout, washboard, whoops, hills) that span a length of trail will be considered a section. Sections are to be indicated by intersections between trails and/or mile markers (trail markers/ carsonites). Sections can be from one intersection to another, from intersection to mile marker, or mile marker to mile marker. In most cases, sections will be indicated between two-mile markers along the trail. A section is at minimum between two-mile markers (0.1 mile) or between an intersection and the first mile marker. Sections can be longer that 0.1 mile depending on how far the conditions span. Mile markers indicating the beginning and ending of the section are to be recorded. Sections can be different year-to-year as conditions may have changed.

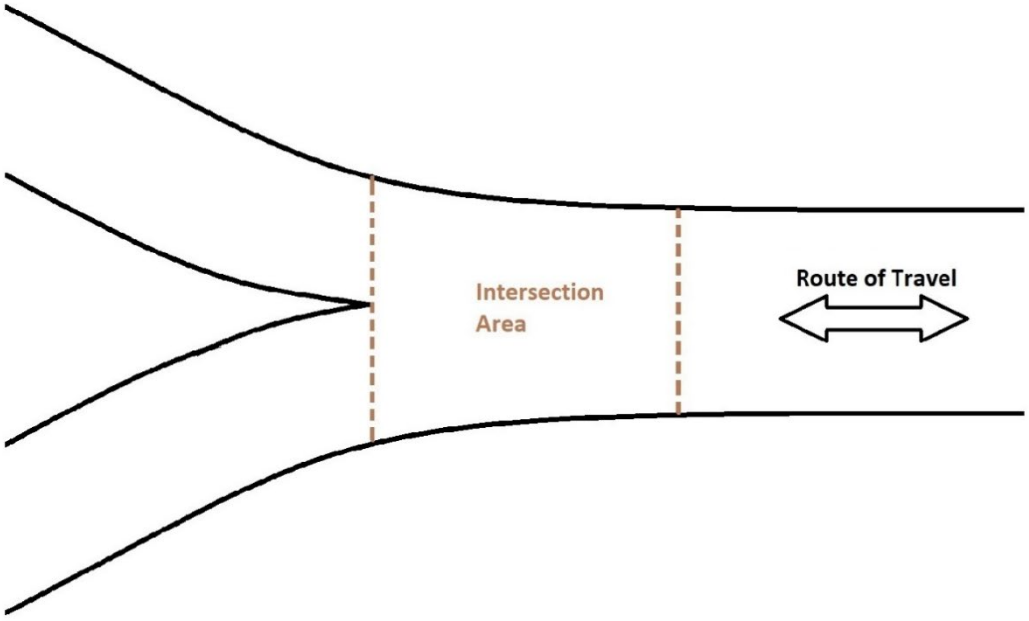
If there is a significant change within the trail but it is smaller than the smallest section allowed (0.1 mile), a 0.1 mile section will be created with that feature in the section. Though the feature may not represent the section as a whole, this significant change can be captured within the section, either with cause codes, GYR conditions, and/or notes in the comments.

Sections of trail can include intersections. If there is an intersection within the section being evaluated, assess the intersection separately from the section as a whole. In this case, the section of trail will have two assessment lines, one for the “standard” trail area and one just for

the intersection. The intersection should be evaluated and indicated in this portion of the datasheet by writing “Intersection”.







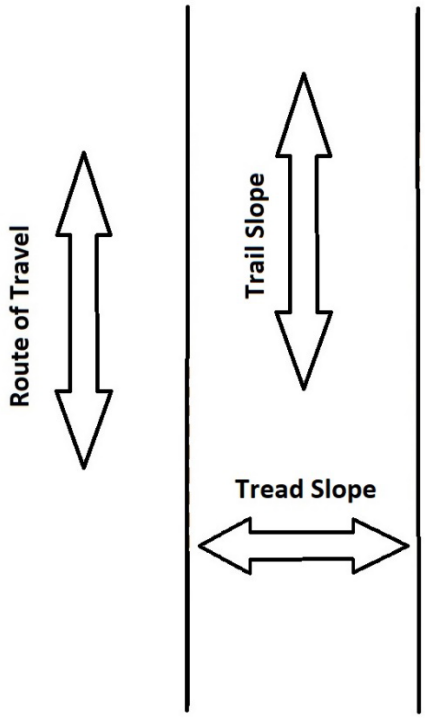
Trail Slope – Using the clinometer, measure the slope along the trail section as percent (%) slope. If there are varying slopes within the section, measure in multiple locations along the section to show the range of slopes within the section. Record the range of slope for the section as well as the most common slope (%). **[**Example: When assessing a section of Cross Over Trail, the section has both flat and hilly terrain but is predominantly flat. To show that this section of trail has varying slopes, measurements should be taken in multiple locations of the flat area and on the hill slopes, providing the range of the section. Additionally, the most common slope for the section of trail should be indicated. In this scenario, the lowest slope in the section was 3%

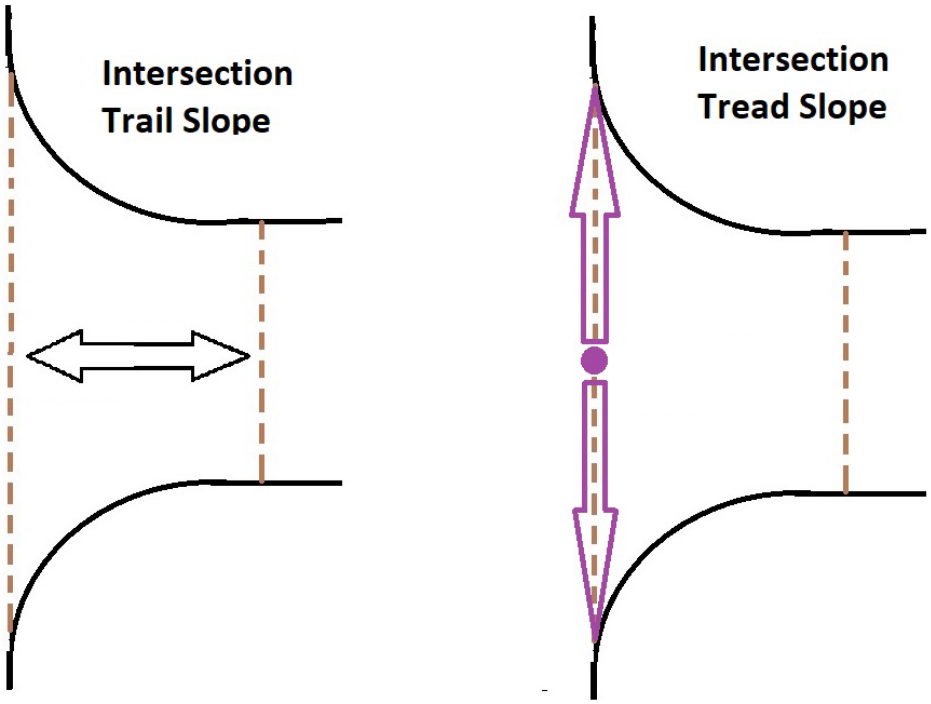
and the highest was 25% with 6% slope being the most common slope through the section. This can be recorded as such: 3 – 25% (6%).**]**

At the intersection, take the slope from the end of the intersection to where the intersection begins. In some cases the intersection begins where the trail begins to widen and merge into the perpendicular trail.

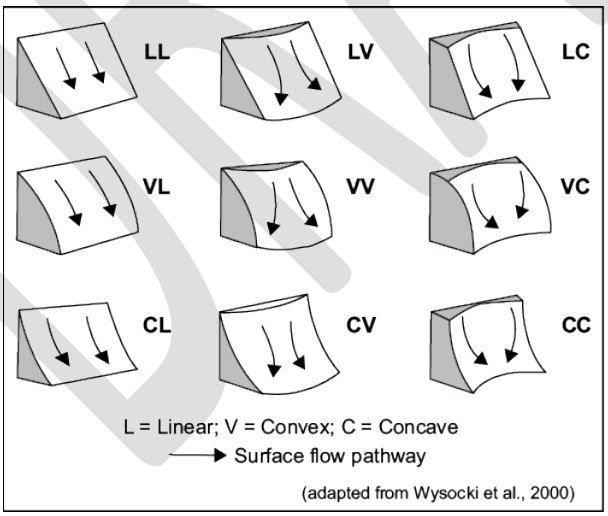
Tread Slope – Using the clinometer, measure the slope across the tread of the trail. Measurements should take place from hinge point to hinge point of the trail and be at a representative point of the section.

At an intersection, there will be two measurements for tread slope. At the mouth of the intersection (where the trail you are assessing intersects with the next trail), stand in the center and measure slope to each hinge point.



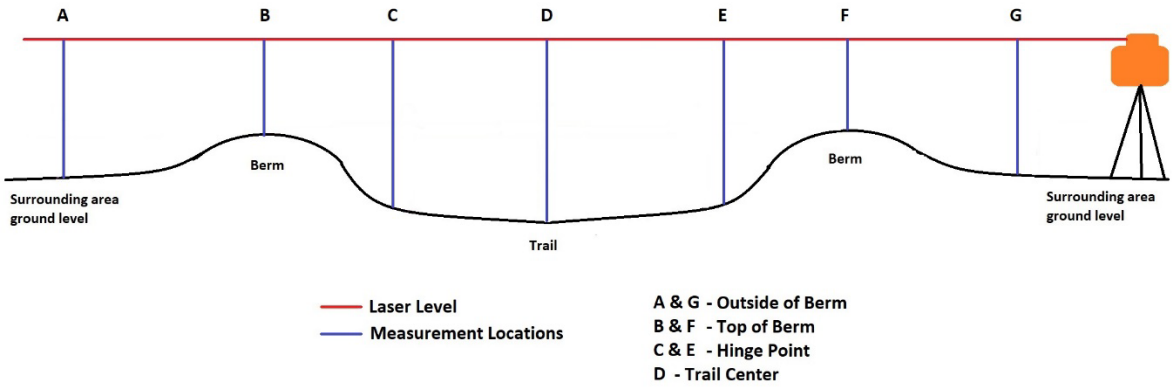


Slope Shape – Where there are slopes long the trail, enter the slope shape or contour of the section being evaluated. Aspects are linear (L), convex (V), and concave (C). See below for slope shape example. Linear (L) has a general straight direction or form. Convex (V) slope shape has rounding outwards of the trail or slope while concave (C) has rounding inward of the trail or slope. **Slope shape may not apply to sections of trail that are generally flat**.

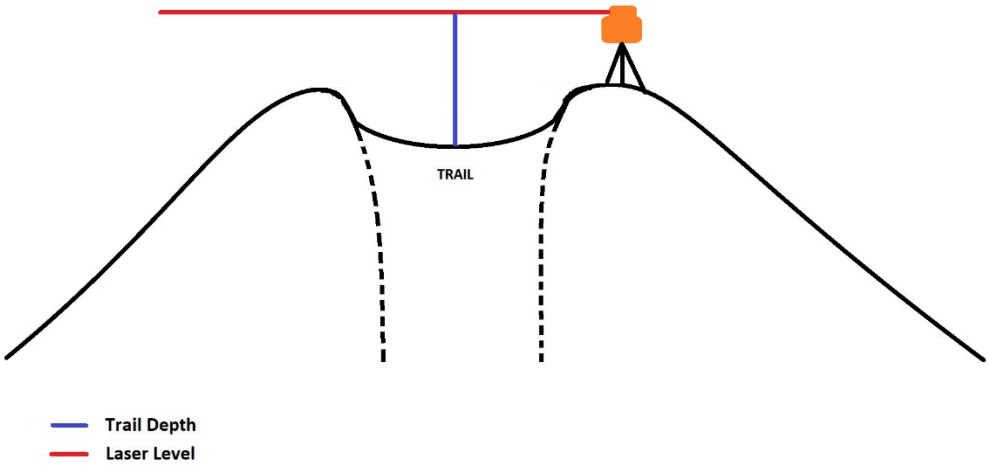


Trail Measurements – At a representative point of the section (representative of the trail depth/ entrenchment), measurements will be taken to calculate trail width, trail depth, and berm height. Using the Spectra Precision Laser GL422, position the device outside of the trail on the surrounding are ground level. Once in place, use the survey measuring rod to read the

height between the laser level and the ground at seven locations across the trail. Measurements are taken outside of both berms where the ground is level with the surrounding area, at both hinge points, on top of the berms, and in the center of the trail. Each location is numbered from A to G, refer to diagram below. Enter the heights in the datasheet according to the diagram below.

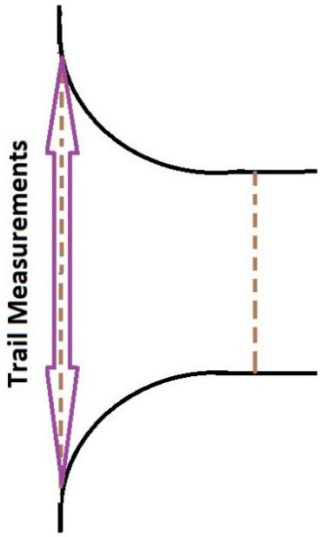


Sections of trail with embankments should only measure for trail depth. Use the laser level to measure the depth of the trail. Additionally, take a measurement of the height of the laser level from where it sits on top of the embankment. The trail measurement subtracted by the height of the laser level will provide the trail depth. Record the measurement on the data sheet in slot D. **[**Example: Areas in Poleline Road or Cross Over Trail have the trail going over hills where there are not berms but embankments.**]**



Using a transect tape measure hinge point to hinge point to calculate the width (W).

At an intersection, trail measurements should be taken at the mouth of the intersection. The mouth of the intersection is where the trail lines up with the trail corridor of the intersecting trail. See diagram below.



Cause Codes – Cause Codes are indicators seen on the trail that are used to evaluate the section and corresponds to the GYR rating scale. Use cause codes provided and enter related cause code(s) for each trail section. Most trail condition problems have multiple causes, generally one to three causes. List the cause codes in order of importance. This will generally describe what problems are seen within the section. If the cause of an observed condition is unique, describe the cause in the comments column. A cause code and GYR condition code will usually both describe the problem. If a section does not seem to have any problems, there may not be a cause code.

Substrate – What substrate is this trail mostly consist of? Substrate types include gravel, coarse/medium sand, fine sand/silt, and clay/mud. List the substrate type that most characterizes the section of trail.

Comments – Record observations not captured by basic codes or other evaluating features, including unique non-repeatable data.

Photos – Photos should be taken for each problem or section. At a minimum, one photo should be taken for each section given a Red condition code. If the entire trail segment has been rated Green, take at least one photo of a representative section of the trail segment. General trail photos should be taken from the center of the trail with the trail enveloping most of the photo (minimal sky within the photograph).

Rating (GYR) – Enter appropriate Green Yellow Red (GYR) condition rating using the OHV Trail Condition Evaluation Code Key. There are eight conditions listed, each with a GYR rating. Select the rating that best fits the conditions (1-8). Not all conditions may apply to the trail section (i.e. sand drift, off-trail travel (open ride), off-trail travel (trails only), or intersections). Additional details not captured by the GYR descriptions can be written in the comments section of the

form. Refer to OHV Trail Condition Evaluation Code Key for further explanation regarding rating selection.

Overall Score – The GYR ratings given will indicate a score for each trail condition. The overall score is the average of all the GYR condition scores of the section. For sections not evaluated as intersections, the sum of all the GYR scores should be divided by 6 to get the average. Intersection GYR scores should be summed and divided by 7 to get the average.

District Trail Terminology

The District has developed standardized terminology of trail features, which allows staff from various classifications and backgrounds to have consistency when discussing trail maintenance. Below are the terms as defined by Ocotillo Wells District staff.

Working Area/Maintenance Corridor (Corridor): The area of which maintenance work will occur. Typically contains the area from the outside of one berm to the outside of the other berm. When hillsides or other features are present, the working area may be limited.

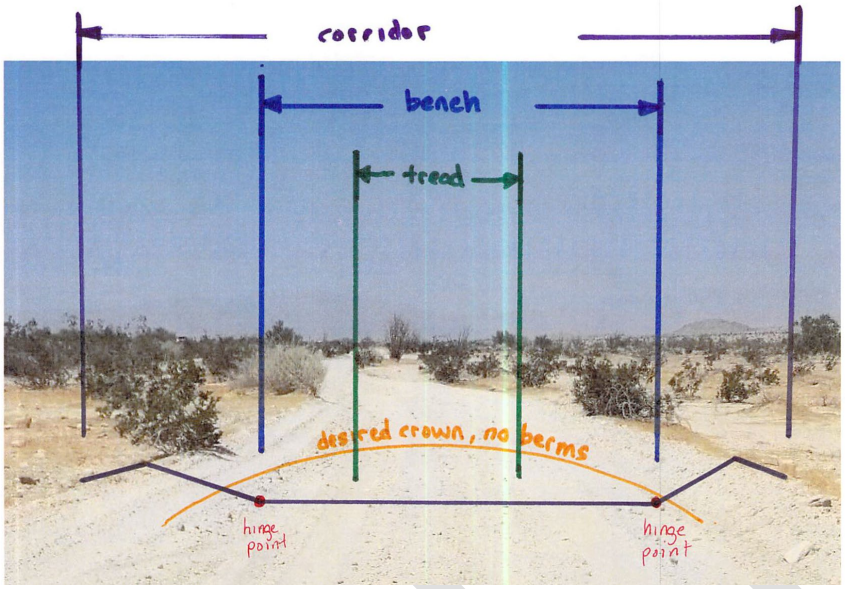
Embankment: Natural features, such as a hill or other landscape feature, that extend above the trail. As these features exist naturally, rather than due to maintenance or mechanical reasons, work may not extend beyond any berms that exist. If a berm is not present, the hinge points of the trail are the extent of the maintenance corridor.

Tread (Bench): The portion of trail where driving is to occur or intended to occur. While the District uses these terms interchangeably, the tread is a subset of the bench. The bench refers to inside of berm to inside berm while tread refers to the center of the trail where driving tends to occur.

Crowned: A tread shape where the center of the tread is raised to allow water to disperse to either side of the trail.

Hinge Point: Bending point of trail between tread and berm.

Shoulder: The area for accommodating vehicles without disturbing traffic in the corridor. This could be two feet outside of the corridor. If the trail is low-lying, it could be the berms on either side of the trail.



Additional Definitions

Rill – shallow channel (no more than a few inches deep) cut in soil by erosion of flowing surface water. They are narrow and shallow channels eroded into soil by hillslope runoff.

Gully – landform created by running water or commonly a combination of both eroding sharply into soil or other relatively erodible material, typically on a hillside or in river floodplains or terraces. Gullies resemble large ditches or small valleys. Gullies are commonly related to intermittent or ephemeral water flow usually associated with localized intense rainfall events.

Slough – soil falling off banks and slopes. Soil sloughs off similarly to landslides and is a shallow phenomenon with mostly the uppermost layers of the soil.

Fill slope – soil material on the edge of trail on the downhill side

Side cast – excavated material moved onto the fill slope of an excavated or bladed trail

Sheet erosion – Erosion caused by flowing water, occurs as a shallow 'sheet' of water flowing over the ground surface, resulting in the removal of a uniform layer of soil from the soil surface.

Watercourse – a stream, channel, or artificial constructed water channel

Mid-channel bars/ Braid bars – river or stream landforms typically present in braided river channels. The formations are also known as medial, longitudinal, crescentic, transverse bars, and sandflat.

Side cast – Material pushed from the trail onto the side of the trail.

Outslope – The downhill side of the trail when the trail is on a slope.

OWSVRA OHV Trail Condition Evaluation Form

Trail Name: ____________________________________ Trail Score: _________ Trail Rating: __________ Rated by ____________________ Date ______________

Site Characteristic/Trail Description:____

Section B= Begin E=End	Trail Slope (%)	Tread Slope (%)	Slope Shape	Trail Measurements (ft, in)	Cause Code(s)	Substrate	Comments	Rating: (GYR) G = 1, Y = 2, R = 3, N/A = 0	Overall Score
B: E:				A _____ft _____in E _____ft _____in B _____ft _____in F _____ft _____in C _____ft _____in G _____ft _____in D _____ft _____in W _____ft _____in				1 ____ 5 ____ 2 ____ 6 ____ 3 ____ 7 ____ 4 ____ 8 ____	
B: E:				A _____ft _____in E _____ft _____in B _____ft _____in F _____ft _____in C _____ft _____in G _____ft _____in D _____ft _____in W _____ft _____in				1 ____ 5 ____ 2 ____ 6 ____ 3 ____ 7 ____ 4 ____ 8 ____	
B: E:				A _____ft _____in E _____ft _____in B _____ft _____in F _____ft _____in C _____ft _____in G _____ft _____in D _____ft _____in W _____ft _____in				1 ____ 5 ____ 2 ____ 6 ____ 3 ____ 7 ____ 4 ____ 8 ____	
B: E:				A _____ft _____in E _____ft _____in B _____ft _____in F _____ft _____in C _____ft _____in G _____ft _____in D _____ft _____in W _____ft _____in				1 ____ 5 ____ 2 ____ 6 ____ 3 ____ 7 ____ 4 ____ 8 ____	
B: E:				A _____ft _____in E _____ft _____in B _____ft _____in F _____ft _____in C _____ft _____in G _____ft _____in D _____ft _____in W _____ft _____in				1 ____ 5 ____ 2 ____ 6 ____ 3 ____ 7 ____ 4 ____ 8 ____	
B: E:				A _____ft _____in E _____ft _____in B _____ft _____in F _____ft _____in C _____ft _____in G _____ft _____in D _____ft _____in W _____ft _____in				1 ____ 5 ____ 2 ____ 6 ____ 3 ____ 7 ____ 4 ____ 8 ____	

Reviewed by _____________________ Date _____________ Page ____ of ____

Section B= Begin E=End	Trail Slope (%)	Tread Slope (%)	Slope Shape	Trail Measurements (in)	Cause Code(s)	Substrate	Comments	Rating: (GYR) G = 1, Y = 2, R = 3, N/A = 0	Overall Score
B: E:				A _____ft _____in E _____ft _____in B _____ft _____in F _____ft _____in C _____ft _____in G _____ft _____in D _____ft _____in W _____ft _____in				1 ____ 5 ____ 2 ____ 6 ____ 3 ____ 7 ____ 4 ____ 8 ____	
B: E:				A _____ft _____in E _____ft _____in B _____ft _____in F _____ft _____in C _____ft _____in G _____ft _____in D _____ft _____in W _____ft _____in				1 ____ 5 ____ 2 ____ 6 ____ 3 ____ 7 ____ 4 ____ 8 ____	
B: E:				A _____ft _____in E _____ft _____in B _____ft _____in F _____ft _____in C _____ft _____in G _____ft _____in D _____ft _____in W _____ft _____in				1 ____ 5 ____ 2 ____ 6 ____ 3 ____ 7 ____ 4 ____ 8 ____	
B: E:				A _____ft _____in E _____ft _____in B _____ft _____in F _____ft _____in C _____ft _____in G _____ft _____in D _____ft _____in W _____ft _____in				1 ____ 5 ____ 2 ____ 6 ____ 3 ____ 7 ____ 4 ____ 8 ____	
B: E:				A _____ft _____in E _____ft _____in B _____ft _____in F _____ft _____in C _____ft _____in G _____ft _____in D _____ft _____in W _____ft _____in				1 ____ 5 ____ 2 ____ 6 ____ 3 ____ 7 ____ 4 ____ 8 ____	
B: E:				A _____ft _____in E _____ft _____in B _____ft _____in F _____ft _____in C _____ft _____in G _____ft _____in D _____ft _____in W _____ft _____in				1 ____ 5 ____ 2 ____ 6 ____ 3 ____ 7 ____ 4 ____ 8 ____	
B: E:				A _____ft _____in E _____ft _____in B _____ft _____in F _____ft _____in C _____ft _____in G _____ft _____in D _____ft _____in W _____ft _____in				1 ____ 5 ____ 2 ____ 6 ____ 3 ____ 7 ____ 4 ____ 8 ____	

16.1 CAUSE CODES

C1	Evidence of cascading runoff from a trail or road upslope (sediment)	C9	Storm intensity unusual or unique for the area
C2	Evidence of cascading runoff from an impervious surface upslope	C10	Maintenance prevents effective drainage
C3	Excess soil moisture at time of use	C11	Uncompacted soil on fill slope
C4	Trail gradient is too steep for the type and/or amount of use occurring	C12	Washboard or whoops
C5	Trail Blockage, e.g. rockfall, landslide	C13	Crossing alters channel dimensions and/or stream gradient
C6	Rocks or roots exposed in tread	C14	Heavy riding activity
C7	Mechanical erosion makes maintenance ineffective	C15	Formation of sand dune(s)
C8	Lack of or missing carsonites along trail	C16	Side cast build up from mechanical erosion

Cause Codes Explanations

C7 – Constant OHV activity makes maintenance activity ineffective **[**Example: 1. Whoops along Shell Reef Expressway between Devil's Slide and Pack Rat. High OHV activity in this area often results in large whoops or lots of wash board even directly after maintenance activity has occurred. 2. Maintenance activity at intersections are unable to be maintained as high riding activity results in the same condition prior to maintenance.**]**

C10 – Current maintenance practices are preventing effective drainage along the trail. Berms or other features (entrenchment) created through maintenance activities can block possible drainage within trails and can cause pooling in the trail.

C11 – Material is moved to outslope and uncompacted creating buildup of material/berm. If compacted it would be a compacted outslope and it would stay an outslope. It can cause berms.

C13 – Where trails cross in and out of washes. Post storm, channels can be changed by flooding activity. If OHV activity creates a new crossing of a wash, the crossing of the wash may alter channel dimensions. [Example: Poleline Road or Freedom Trail)

C16 – Riding activity at turns along the trail or between intersections can push material out from the trail onto the side, creating a build up of side cast material either where the berm should be or into the trail (when at an intersection).

16.2 OHV Trail Condition Evaluation Code Key

		Green (1)	Yellow (2)	Red (3)
1	**Tread**	Minimal or no uneven tread such as washboard, ruts, potholes, and whoops.	Moderate uneven tread. Washboarding covers half the section, multiple ruts, or a few whoops in trail tread.	Tread is majority or all uneven. Washboarding cover most of section, excessive ruts, or severe whoops along trail. Potholes present.
2	**Trail Width**	Trail width is generally no greater than 1 times the determined width for the designated use.	Is generally greater than 1.5 times the design width for the determined use and appears to be increasing and beginning to show erosion, sedimentation, and damage to vegetation.	Is generally greater than 2 times the design width for the determined use or has caused erosion, sedimentation, and damage to vegetation.
3	**Trail Depth**	Trail depth is equal to or less than 6 in compared to the surrounding area.	Trail depth is between 6 in and 12 in compared to the surrounding area.	Trail depth is over 12 in compared to the surrounding area.
4	**Berms**	Berm is equal to or less than 6 in higher than the surrounding area.	Berm is between 6 in and 12 in higher than the surrounding area.	Berm is over 12 in higher than the surrounding area.
5	**Sand Drift**	Minimal to no fine windblown sand built along trail.	Small sand dunes forming on the side of trails or covering about half the trail	Large sand dunes crossing the entire span of trail for extended portion on trails
6	**Off-trail Travel (Open Ride)**	Off-trail travel is common and some erosion is apparent. Minimal resource damage.	Off-trail travel has caused moderate resource damage, erosion, eroded hill climbs, damage to vegetation and/ or sensitive habitat. Trail delineation is difficult to follow.	Off-trail travel has caused severe resource damage, erosion, eroded hill climbs, or extensive damage to vegetation and/or sensitive habitat. Designated trail not defined.
7	**Off-trail Travel (Trails Only)**	Off-trail travel is limited to single tracks or single passes. Tracks are not eroded.	Off-trail travel is common and well defined. Moderate erosion. Trail delineation difficult to follow.	Off-trail travel has caused severe resource damage, erosion, eroded hill climbs, or extensive damage to vegetation and/or sensitive habitat. Designated trail not defined.
8	**Intersection Tread Slope**	Tread slope percent height difference less than 25%.	Tread slope precent height difference is between 25 – 50%.	Tread slope precent height difference is greater than 50%.

*Each trail condition will provide a number score depending on the rating given. The number of points is given as shown above, green is one point, yellow is two points, and red is three points. If there a trail condition does not pertain to certain sections of trail, count that category as zero points.

OHV Trail Condition Evaluation Code Key – GYR (Green, Yellow, Red)

Each rating (GYR condition) may not pertain to the section of trail. Only note ratings that relate to the trail section being evaluated. Use the directions and prompting questions for each condition below to help determine what rating to give for each section. Select either green, yellow, or red for each condition that pertains to the trail section. Do not note conditions that are not present in the section. If a trail condition is not described by the GYR code key, describe in the comments section.

GYR scoring will always be a 1, 2, or 3. **No half points are to be given for a score.**

Tread – How is the trail tread? Is the drive through the section smooth? Are there any "bumps" in the trail such as wash boarding or ruts? Small rocks in the trail should not count. Are there potholes in the trail and how bad are they? If there are features such as potholes, washboard, ruts, and whoops to what degree do they affect the trail?

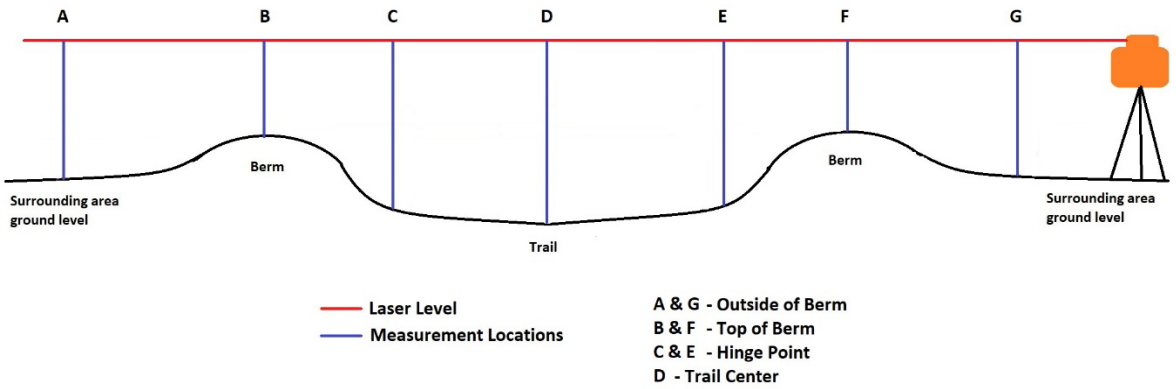
Tread width – Width was taken during the trail measurements. Rate the current trail width in comparison to determined width of the trail segment. Is the trail width the expected width, 1.5 times wider, or generally 2 or more times wider? Refer to determined trail width map and chart below when selecting GYR rating. Trail widths will not exactly match those within the chart below, select the rating that is closest to the current measured width. Round the width to the nearest rating.

Width	G	Y	R
1 Car Length	10 ft	15 ft	20 ft
1.5 Car Length	15 ft	22.5 ft	30 ft
2 Car Length	20 ft	30 ft	40 ft
2.5 Car Length	25 ft	37.5 ft	50 ft

Trail depth – Using the trail measurements average trail depth will be calculated. Using the outside of berm measurements (1 and 7) and the center trail measurement (4) a trail depth can be calculated. Subtract measurement #1 from measurement #4 to get the trail depth based on that side of the trail. To get the trail depth based on the opposite side, subtract measurement #7 from measurement #4. Add these two numbers together and get the average by dividing the sum by 2. This will give the average trail depth. Rate the trail depth condition based on this result. Calculation formula below.

$$\text{Average Trail depth} = [(D - A)+(D - G)]/2$$

For trails with embankments, depth should have been measured and needs no additional calculations. However, if measurements were taken using the laser level on the ground the height of the level from the base of the device must be subtracted from the depth measurement taken to provide a true trail depth. Is the depth equal to or less than 6 in, between 6 in and 12 in, or over 12 in in comparison to the surrounding area?



Berms – Refer to trail diagram above. The average berm height can be calculated using measurement A, B, F, and G. Subtract measurement B from A to get one berm height and F from G to get the other berm height. Add the two berm heights together and divide by 2 to get the average berm height. If the average berm height is equal to or less than 6 in it is green, between 6 in and 12 in is yellow, greater than 12 in it is red. This will not pertain to trail sections with embankments where there are no berms.

Average Berm Height = [(A - B)+(G - F)]/2

Sand Drift – Is there fine wind blown sand build up along the trail? How much fine windblown sand is building up (creating dunes) along the trail? Are there small dunes creeping into the trail or just one dune covering part of the trail (yellow)? Are the dunes spanning across the whole trail for large portions of the trail (red)? If this section does not have any fine wind blown sand there will be no rating.

Off-trail Travel (Open Ride) – This pertains to areas west of Poleline Road. Is there off trail travel from designated trail? How is that off-trail travel affecting the area from the trail? If off-trail travel is occurring, there will be some erosion that will occur. Is the off-trail travel causing resource damage to vegetation or causing accelerated erosion? Is the trail delineation difficult to follow due to the off-trail travel or missing carsonite markers?

Off-trail Travel (Trails Only) – This pertains to areas east of Poleline Road. Is there off trail travel from designated trail? How is that off-trail travel affecting the area from the trail? Is the off-trail travel causing resource damage to vegetation or causing accelerated erosion? Is the trail delineation difficult to follow due to the off-trail travel or missing carsonite markers?

Intersection Tread Slope – Two tread slope measurements were taken at the mouth of the intersection. Take the measurements and subtract the smaller number of the two from the larger number. With this difference, divide this number by the average of the two numbers. Multiply this by 100% to get the percent difference. Is this difference less than 25%, between 25% to 50%, or greater than 50%?

(larger number – smaller number)/average x 100 = % difference