

ZION NATIONAL PARK (ZION)

Size 59,900 hectares (148,016 acres)

Park History and Purpose Zion National Park was originally protected by Presidential Proclamation No. 877 (36 Stat. 2489) on July 31, 1909 as Mukuntuweap National Monument. On March 18, 1918 the monument was enlarged and the name changed to Zion National Monument (40 Stat. 1760). The enlargement was effected to protect “unusual archeological, geologic and geographic interests...”, and to provide opportunities for visitor enjoyment of its grandeur and scenic features. The area received National Park status by the provisions of the Act of November 19, 1919 (41 Stat. 356). Subsequent Presidential Proclamation No. 2221 of January 22, 1937, established a Zion National Monument adjacent to the then existing park. The park and monument were combined in 1956 by an act of Congress (70 Stat. 527).

The purposes for which Zion National Park was established are delineated in the Presidential Proclamation dated March 18, 1918. These purposes as interpreted in Zion National Park Statement for Management (NPS 1994b) and the General Management Plan (NPS 2001b) are

- Preserve the dynamic natural processes of canyon formation as an extraordinary example of canyon erosion.
- Preserve and protect the scenic beauty and unique geologic features: labyrinth of remarkable canyons, volcanic phenomena, fossiliferous deposits, brilliantly colored strata, and rare sedimentation.
- Preserve the archeological features that pertain to the prehistoric races of America and the ancestral Indian tribes.
- Preserve the entire area intact for the purpose of scientific research.
- Provide a variety of opportunities for visitors to learn about and enjoy the resources
- without degrading those resources.

In addition to park purposes stated above, it is also a purpose to manage the park in compliance with 1916 Organic Act, Wilderness Act, National Environmental Policy Act, National Historic Preservation Act, Native American Graves Protection and Repatriation Act, An Act to Establish Redwoods National Park, Endangered Species Act and others that may apply. In addition, the Zion National Park Resource Management Plan (NPS 1994a) supplements other park documents and legal mandates to provide guidance and direction for the long-term management of the natural and cultural resources.

Location Southwestern Utah within portions of Washington, Kane, and Iron Counties. Lying on the western extremity of the Colorado Plateau, 72 kilometers (45 miles) (by road) northeast of St. George, Utah, 523 kilometers (325 miles) south of Salt Lake City, Utah, and 254 kilometers (158 miles) northeast of Las Vegas, Nevada.

Elevation Elevations range from 1,128 meters (3,700 feet) in the southwestern corner to 2,660 meters (8,726 feet) on Horse Ranch Mountain in the northeast.

General Description ZION is characterized by high plateaus, a maze of narrow canyons, and striking rock towers and mesas. Encompassing the southern and western perimeter of the Kolob Terrace (a southern extension of the Markagunt Plateau), the Park exhibits outstanding exposures of Permian through Cretaceous rocks. Due to the downcutting of the Virgin River, Zion Canyon provides a spectacular display of Triassic and Jurassic sediments, the most spectacular of which is the 2,000-foot thick exposure of Navajo sandstone.

The park is located at or near the common boundaries of 3 major vegetative zones, the Colorado Plateau to the north and east, Mojave desert to the south and southwest, and the basin and range to the west. This intermingling of zones combines with the rugged canyons and myriad streams and springs to produce microhabitats with a heterogeneous system of flora and fauna.

Flora Vegetative communities are varied and consist of desert scrub at the lowest elevations, pinyon-juniper woodland and mountain shrub communities at middle elevations, and coniferous forest at the highest elevations. Rock crevice communities cover large portions of the east side where opportunistic vegetation grow in slickrock cracks. Hanging gardens are unique communities that grow on vertical rock walls hosting seeps and springs. The numerous watercourses, including the North and East Forks of the Virgin River are lined with riparian vegetation consisting largely of Fremont cottonwood (*Populus fremontii*), velvet ash (*Fraxinus velutina*), box elder (*Acer negundo*), and seepwillow (*Baccharis* spp.). Over 890 species of vascular plants have been identified.

Fauna Over 400 birds, mammals, reptiles, amphibians, and fish occur. Amphibians are numerous along watercourses. Common amphibians are the Arizona toad (*Bufo microscaphus microscaphus*) and red-spotted toad (*Bufo punctatus*). Reptiles occur park-wide, with northern plateau lizards (*Sceloporus undulatus elongatus*), side-blotched lizards (*Uta stansburiana*) and 2 species of whiptails (*Cnemidophorus* spp.) dominating the lower elevations and sagebrush lizards (*Sceloporus graciosus*) prevailing in elevations above 5200 ft. Snakes, while present, do not seem particularly numerous. Great Basin rattlesnake (*Crotalus viridis lutosus*), desert striped whipsnake (*Masticophis taeniatus*), and California kingsnake (*Lampropeltis getula californiae*) may be most abundant. The most common mammals include mule deer, rock squirrels, and desert cottontails. Desert bighorn sheep (*Ovis canadensis nelsoni*) have been reintroduced and appear to be healthy and increasing. Mountain lions (*Felis concolor*), while secretive and elusive, are apparent through sign which seems ubiquitous. Birds are most abundant in the riparian vegetation along the Virgin River and its tributaries. Four species of native fish populate the North and East Forks of the Virgin River, and greatly outnumber exotic species.

Aquatic Features Water resources include springs, seeps, tinajas, and the Virgin River and its tributaries. The park contains one of the last mostly free flowing river systems contributing to major canyon formation on the Colorado Plateau. Only a moderate amount of water development has occurred upstream, such as Kolob Reservoir in 1957. Flow regimes are characterized by snowmelt runoff during the April-June season and

summer monsoonal thunderstorms during the July-August season. Flow regimes provide highly variable daily flows which are important to water-related resource attributes and ecosystem values.

A National Wetlands Inventory is currently in progress to map seeps and springs. These ground to surface water flows support hanging gardens and grottos that nourish unique vegetation and endemic fauna.

Unique Features and Species of Special Concern

Special Vegetation Communities The Riparian/Wetland community consists of springs, seeps, hanging gardens, and riverine systems. These areas are critical oases in an arid environment, providing productive and unique habitats for wetland plant species and a high diversity of aquatic invertebrates, amphibians, resident and migratory birds, fish, native pollinators and other organisms that create ecological balance. The Quaking Aspen (*Populus tremuloides*)/ White Fir (*Abies concolor*) community is restricted to higher elevations. These stands are becoming decadent, most likely due to past fire suppression. Little is known about biodiversity within these stands. The many Isolated Mesa Tops are believed to have undisturbed populations of relict flora, offering rare opportunities for scientific research of relatively pristine environments.

Rare and Threatened Plants ZION contains one Federally endangered plant species, the Shivwits milkvetch (*Astragalus erectimus* var. *ampullariodes*). This species was recently listed because of its extremely limited range, growing only on a specific geologic formation—the Chinle. At least 20 other rare plant species occur, consisting of endemics and disjunct populations. Most rare plants are psammophytes (i.e., plants specifically adapted to grow in sand, sandy depressions, and sandstone crevices). Distribution and abundance inventories rare plants are needed, especially in remote areas.

Animals Federally listed animal species include 3 listed birds, and one listed reptile. The Threatened Mexican spotted owls (*Strix occidentalis lucida*) inhabits narrow canyon habitats. In addition, southwest willow flycatcher (*Empidonax traillii extimus*) has been found during summer months in patches of dense riparian vegetation. In winter, bald eagles (*Haliaeetus leucocephalus*) perch in towering cottonwoods along watercourses. A small population of desert tortoise (*Gopherus agassizii*) exists at one low elevation site.

Among sensitive species is the recently delisted peregrine falcon (*Falco peregrinus*) which thrives on and around the steep canyon walls where it nests. The park also hosts the Virgin spinedace (*Lepidomeda mollispinis mollispinis*), a small fish which is narrowly kept from threatened status through a habitat conservation agreement amongst numerous land management agencies. Another sensitive species, the endemic Zion snail (*Physa zionis*) inhabits unique hanging garden habitats. The northern leopard frog (*Rana pipiens*) is a rare resident which seems to be disappearing regionwide due to unknown causes.

Resource Management Concerns

Recreational Use Visitation has been on the increase throughout the 20th century. Park visitors numbered 3,692 in 1920. In 1996, visitation reached 2.5 million per year. As

more visitors arrived, impacts became noticeable. Fragile ecosystems around riparian areas are being trampled and eroded while human waste and toilet paper accumulate around camping areas threatening the quality of backcountry water sources. Other resource impacts caused by increasing visitor use include soil erosion, loss of critical microbotic soils, desertification, vegetation trampling and denudation, root exposure, and resultant degradation of wildlife habitat and ecological function.

As part of the Visitor Experience Resource Protection (VERP) process some soil comparisons have been made between sites impacted by recreationists and sites not impacted. With the advent of the Zion Transportation System it is thought that visitor use patterns may change. Site monitoring has been established in several locations to assess impacts of changes on vegetation and soils.

Land Use Impacts Land development continues around the perimeter. While a water-rights agreement has protected instream flows in the North and East Forks of the Virgin River, individual springs and seeps may still be impacted by the use of ground water by development around the park. Water quality may be impacted by cattle grazing in areas upstream. While the park actively controls noxious weed species, seed sources from outside are able to establish by floating downstream or arriving on wind currents from infested areas. Cattle grazing continues around the park and within inholdings. Trespass cattle damage is an ongoing problem as is degradation of habitat due to past grazing within the park.

Invasive Exotic Plant Species Over 100 non-native plant species occur. Nine are of top management concern for control and eradication. Tamarisk (*Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*) are primary invasive species along riparian areas. Scotch thistle (*Onopordum acanthium*) and woolly mullein (*Verbascum thapsus*) are common along trails and disturbed areas in the front and backcountry. Around the developed area, showy nightshade (*Solanum elaeagnifolium*), Russian thistle (*Salsola pestifer*), tree-of-heaven (*Ailanthus altissima*) and Johnson grass (*Sorghum halapense*) are abundant. Other problem species include numerous exotic grasses, yellow sweet clover (*Melilotus officinalis*), and exotic thistles. Control actions and some inventory are in place for high priority locations and problem species. Extensive inventories for invasive non-native weeds are needed to aid prioritization and control.

Degradation of Riparian Areas To a large degree native riparian vegetation is not regenerating within Zion Canyon. Flood prevention measures have been successful in preventing widespread flooding which provides the moist, bare substrate necessary for riparian plant regeneration. Control of the river course, provided by gabions, has prevented natural meanders and have promoted the deepening river channel and drying of the streamside terraces. The resultant vegetation consists largely of an overstory of mature cottonwoods, boxelder, and velvet ash, many of which are dead and dying. Little or no native midstory vegetation exists and in certain areas, only herbaceous cover is in place. Regenerating woody vegetation is mostly non-native species, specifically tamarisk, which exudes salt and effectively prevents natives from establishment. This in turn causes loss or degradation of wildlife habitat.