

Bruneau Dunes State Park

Introduction: One of Idaho's great scenic and natural wonders is the Bruneau Dunes. It is the largest single structure sand dune in North America. It is among the "must see" attractions of Idaho. Further, for many Idahoans, climbing to the top is a must do. Bruneau Dunes State Park is also a place where the visitor can experience an outstanding example of the great basin desert landscape province. This is one of Idaho's premier natural parks.

Getting There: From the north, you can get to Bruneau Dunes State Park by taking Hwy. 51 south from Mountain Home, ID. Continue on this highway until you cross the Snake River. Shortly after that, you must turn left on Hwy. 78. The turn off to Bruneau Dunes State Park will then be coming up quickly on the right. From the south, take Hwy. 78 west from Hammett, ID. Continue on this highway for about 12 miles and the turn to Bruneau Dunes will be on your left.

Major Features:

The Dunes: The dunes rise to 470 feet high above a desert valley called Eagle Cove. The dunes are about 600 acres in size. The dunes are unique in the Western Hemisphere in their formation and stand in vivid contrast to the surrounding plateau. The combination of a source of sand, a relatively constant wind activity, and a natural trap have caused sand to collect in the Eagle Cove. The dunes has a unique 300 foot deep vortex crater. It is a result of two separate dunes acting to create it as no sand is deposited where the ends of the two dunes overlap. In the 1970s NASA actually came here to study this phenomenon because similar wind craters are found on the dunes on Mars. Because they are a natural wonder, no vehicles are allowed on the dunes.

The Lakes: Construction of the C.J. Strike Dam on the Snake River began in 1950 and was filled by 1952. As the dam filled the surrounding water table began to rise and two small lakes began to appeared spontaneously adjacent to the sand dunes. The lakes were at first maintained by local irrigation activities. But as irrigation methods changed the lakes began to recede. But by then Idaho anglers had gotten accustomed to having these lakes available for early season fishing. So today the Bruneau Dunes lakes are maintained by pumping water from the nearby Snake River from October to May. The lakes have brought additional plant and animal life to the park area, and also provide an excellent bass and bluegill fishery.

The Park: Bruneau Dunes State Park is classified by IDPR as a natural park. It has a total of 4,800 acres and it situated at an elevation of 2,470 feet. Every year about 85,000 visitors come here with about 61,000 for day use and 24,000 for camping. The park has a variety of recreational facilities available.

The park visitor center is located near the entrance. It has a large paved parking lot with pull through spots for vehicles with trailers. The visitor center has improved restrooms (flush toilets). There is an area adjacent to the parking lot with a landscaped lawn that has shade trees and a picnic table. There is a great panoramic view of the dunes and the surrounding Eagle Cove.

Just before the visitor center, a right turn onto a gravel road leads to the “Equestrian Camp.” It is called that because there are corrals available for horses and many of the parking spurs can accommodate horse trailers. But anybody can camp there that wishes. There are 19 standard campsites (no hook-ups) here. There is one vault toilet and one group shelter. There are a few small trees, but most of the campsites have a sunny exposure. The campground is a trailhead for horse and hiking trails. There is a great panoramic view of the dunes and the surrounding Eagle Cove.

The Broken Wheel campground is located along the main park road. There are 46 campsites here that are situated along the “spokes” of a round loop road that resembles a wheel. There are 31 campsites with water and electrical hook-ups. Another 12 are standard campsites (no-hook-ups). There are five sites provided for group tent camping that have a capacity of 15, 25, 30, 70, and 70 persons, respectively. Several campsites have individual shelters over their picnic tables. There is a centrally located improved restroom with flush toilets, sinks, and showers. One vault toilet is located on the south side of the campground to serve the group camps. There is also a large gravel parking area for group vehicles and extra vehicles. The park’s RV dump station is located right across the main park road from Broken Wheel campground. Broken Wheel is the oldest campground in the park and therefore has mature shade trees. However, some of the trees are now appearing to be slightly drought stricken. Further, the campground once had beautifully landscaped lawns that are now in a deteriorating condition with weeds like puncture vine taking over.

The Eagle Cove campground is located along the main park road. There are 49 campsites here and all of them have water and electrical hook-ups. While 22 campsites are laid out in a more-or-less normal style with normal spacing, the other 27 are set in two “herring bone” layouts of all pull-through slots that are rather close together that is reminiscent of an RV park. They may be more suitable for large groups rather than individual campers. The improved restroom with sinks and showers is fairly new. There is also a group shelter here capable of handling two groups at a time. There are two camping cabins located at the east end. A vault toilet is situated at the east end as well. The grounds are landscaped, but the trees are young and not yet totally shade worthy.

The observatory day use area has 6 individual picnic tables and several of those have their own shade shelters. There are two paved parking lots that are in a state of disrepair with weeds penetrating the pavement. The observatory building has improved restrooms with flush toilets and sinks. The day use area is landscaped with lawns and trees. But the lawns are in a deteriorating condition. There is a place to hand launch non-motorized watercraft into the Little Dune Lake. A fishing dock is positioned on the shore.

Right after the main park road crosses over a small dune area there is an area where the pavement is non-existent and is surfaced with gravel for about 100 yards before the pavement begins again leading to Lake day use area. This has been in a state of disrepair for about twenty years.

The main park road ends at a gravel parking lot at the Lake day use area. There are 4 individual picnic tables here as well as a group shelter. There is a vault toilet nearby. This is the trailhead for taking the shortest route to the top of Bruneau Dunes. Non-motorized watercraft can be hand launched at the beach into the Lake. The beach area is not a designated swimming area, but it is suitable for swimming.

Geology: There has been volcanic activity at numerous times in Idaho's past, up to as recently as a few thousand years ago. The remnants of shield volcanoes are abundant on the Snake River Plain. Increasing volcanic activity resulted in floods of basalt which poured out onto the Snake River plain. Occasionally, lava dammed streams, forming lakes. Sediments accumulated, filling the lakes. Then the dams overflowed. This action resulted in the creation of the Glenn's Ferry formation which is one of the more prominent geologic features at Bruneau Dunes. Lakes that covered the area built up layers of clay, silt, and some beach sand. Some gravel and sand also washed in from seasonal streams. This is how the layered sedimentary rocks found here were formed, and is believed to be one of the major sources of the sand supply of the Bruneau Dunes.

At the end of the last Ice Age, Pleistocene lakes covered vast areas. The largest single lake to form was Lake Bonneville. Approximately 11,000 years ago, a rise in the ancient Lake Bonneville caused a natural dam near Preston, ID to break. A catastrophic flood 200 times the flow of the present Snake River, followed its path and continued for a least six weeks. The flood carved out an ancient meander in the river. This meander scar is a basin that is about 3.5 miles across and today is called Eagle Cove. The hills that surround Eagle Cove and the floor of the cove are all composed of sedimentary deposits.

Conditions were created that were perfect for dune formation: (1) a circular basin, which forms a natural trap to catch wind born sand; (2) a supply of sand coming from ancient sediments laid down in the Snake River plain; and (3) a wind blowing at least 10 MPH to transport the sand.

Ecosystems and Plant Communities:

The Ponds: The two lakes are more closely defined as ponds rather than lakes. A common definition of a pond is a body of water where light penetrates to the bottom and it is shallow enough for rooted water plants to grow throughout, and it lacks wave action on the shoreline. The ponds provide habitat for wetland plants and animals such as cattails, water-lilies, frogs, turtles and herons. The ponds are fringed by wetlands that support the aquatic food web, provide shelter for wildlife, and stabilize the shore. All ponds are subject to periodic algae blooms and eutrophication which occurs here in late summer and early fall. The shores of the ponds support a rich growth of cattails, Russian olive, elms, cottonwoods, willows, and bulrushes. There is also some salt cedar or tamarisk growing here. It is an invasive species and if allowed to get out of control can crowd out more desirable species.

The Wetlands: On the floor of Eagle Cove near its center, the low spots often catch drainage from the surrounding area and form small areas of standing water and present a marshy appearance. Cattails, Russian olive, willows, and bulrushes grow here in stark contrast to the surrounding sagebrush steppe.

The Land: Bruneau Dunes State Park is mostly within the great basin sagebrush steppe ecosystem. This is characterized by the presence of sagebrush, bitter brush, rabbit brush, and grasses and is sometimes referred to as desert prairie. This ecosystem is common in southern Idaho and is connected to the vast expanses of the "sagebrush sea" that stretches across the great basin area of Nevada, Utah, and southeastern Oregon.

The keynote species is sagebrush. Sagebrush is a very ancient plant as it first showed up in North America about 12 million years ago. The sagebrush steppe of southern Idaho dates back 350,000 years. The sagebrush at Bruneau Dunes State Park is commonly called “big sagebrush” or “Great Basin sagebrush” and scientifically known as *artemisia tridentata*. Sagebrush is an aromatic shrub from the family Asteraceae, which grows in arid and semi-arid conditions, throughout a range of cold desert, steppe, and mountain habitats in the Intermountain West of North America. Sagebrush and other *Artemisia* shrubs are the dominant plant species across large portions of the Great Basin. Sagebrush provides food and habitat for a variety of species, such as sage grouse, pronghorn antelope, gray vireo, pygmy rabbit, and mule deer. Although, pygmy rabbits, sage grouse and pronged horn antelope are the only animals able to eat and digest sagebrush. In fact, pronghorns depend upon sagebrush browse to get them through harsher winters.

Sagebrush is a coarse, many-branched, tall pale-grey shrub with yellow flowers and silvery-grey foliage. It has a deep taproot coupled with laterally spreading roots near the surface that allows sagebrush to gather water from both surface precipitation and the water table. It has small green to grayish leaves with the outer tips divided into three lobes (hence the scientific name *tridentata*). Small yellow flowers that are long and loosely arranged tubular clusters make their appearance in late summer or early fall. Sagebrush is generally long-lived once it makes it past the seedling stage, and can reach ages of over 100 years. Sagebrush has a strong pungent fragrance (especially when wet) due to the presence of camphor, terpenoids and other volatile oils. The taste is bitter and, together with the odor, serves to discourage browsing by many herbivores. It is an evergreen shrub, keeping some of its leaves year-round. Some refer to Bruneau Dunes State Park as a desert, yet sagebrush is not a desert plant, but rather a resident of the steppe that receive 7 to 15 inches of annual precipitation.

Several major threats exist to sagebrush ecosystems, including human settlements, conversion to agricultural land, livestock grazing, invasive plant species, wildfires, and climate change. Prior to it being established as a state park in 1967, the lands at Bruneau Dunes State Park were BLM managed public lands and as such were undoubtedly subject to livestock grazing. In the early days of public land livestock grazing, large areas of sagebrush habitat was burned to make way for grazing animals. The burning of the sagebrush leads to habitat loss of many species and can be very detrimental to the ecosystem as a whole. Furthermore, the destruction of native grasses and forbs by grazing and fire creates conditions where invasive plants colonize the area. The invasive species which has destroyed the largest amount of sagebrush habitat is cheatgrass (*Bromus tectorum*). Since its accidental introduction in the 1890s, cheatgrass has radically altered the native shrub ecosystem by replacing indigenous vegetation, and by creating a fire cycle that is too frequent to allow sagebrush to re-establish itself. Sagebrush is not fire-tolerant and relies on wind-blown seeds from outside the burned area for re-establishment. Today, just half of the West’s sagebrush steppe remains.

The sagebrush ecosystem at Bruneau Dunes State Park is in a state of deterioration. One could say that the park is infested with the invasive species of cheatgrass and tumbleweeds (Russian thistle). The State of Idaho could use Bruneau Dunes as a “showcase” of proper land management through a program to restore the land. However, little is being done in that regard.

Wildlife:

Mammals: The mammals that are present in the park are: coyotes, badger, black tailed jack rabbit, fox, muskrat, cottontail rabbits, pronghorned antelope, and mule deer.

Birds: The birds that are present in the park are: sage grouse, duck, geese, kestrel, red tailed hawk, night hawk, great blue heron, great horned owl, barn owl, long eared owl, raven, peregrine falcon, bald eagle, golden eagle, coot, bufflehead, and grebe.

The keynote species is the greater sage grouse. Once as many as 16 million sage grouse made their home in the same lands as roaming herds of buffalo, elk, mule deer and antelope. Today, Bruneau Dunes State Park does not include the sage grouse among their commonly seen birds and it is perhaps a very rare sight. Park staff could not recall ever seeing them in the park. Never-the-less a mounted specimen is displayed in the visitor center and it is listed on the Bruneau Dunes animals list handed out at the visitor center.

The greater sage grouse (*Centrocercus urophasianus*) is the largest grouse in North America. Its range is sagebrush country in the western United States and southern Alberta and Saskatchewan, Canada. The sage grouse is a permanent resident in its breeding grounds but may move short distances to lower elevations during winter. It makes use of a complex lek system in mating and nests on the ground under sagebrush or grass patches. It forages on the ground, mainly eating sagebrush but also other plants and insects. Sage grouse do not have a muscular crop and are not able to digest hard seeds like other grouse.

Adult sage grouse have a long, pointed tail and legs with feathers to the toes. The adult male has a yellow patch over each eye, is grayish on top with a white breast, and has a dark brown throat and a black belly; two yellowish sacs on the neck are inflated during courtship display. The adult female is mottled gray-brown with a light brown throat and dark belly.

The sage grouse is notable for their elaborate courtship rituals. Each spring, males congregate in leks and perform a "strutting display". Groups of females observe these displays and select the most attractive males with which to mate. After mating, the hen leaves the lek

Morley Nelson Snake River Birds of Prey National Conservation Area.

Bruneau Dunes State Park is surrounding on three sides by the Morley Nelson Snake River Birds of Prey National Conservation Area. It was established by Congress in 1993 to protect a unique desert environment that supports North America's highest density of nesting raptors. More than 700 pairs of raptors nest each spring along 81 miles of the Snake River Canyon, including 150-200 pairs of Prairie Falcons (highest breeding density in the world). Other nesters include American Kestrel, Golden Eagle, Northern Harrier, Osprey, Peregrine Falcon, Red-tailed and Ferruginous Hawks, Barred, Burrowing, Great Horned, Long-eared, Northern Saw-whet, Short-eared, and Western Screech-Owls. In addition to outstanding bird and wildlife viewing, this area hosts various recreational opportunities. Visitors can sightsee, ride on horseback, hike, hunt, mountain bike, picnic and camp. The NCA is one of the many units within the BLM's National Landscape Conservation System which serves to protect and conserve special places on public lands.

for the nesting grounds.

Sage grouse are primarily inhabitants of the sagebrush steppe ecosystems. They occur throughout the range of big sagebrush (*A. tridentata*), except on the periphery of big sagebrush distribution. They are very dependent upon quality sagebrush habitat for several reasons. Open areas such as swales, irrigated fields, meadows, burns, roadsides, and areas with low, sparse sagebrush cover are used as leks. However, leks are usually surrounded by areas with 20 to 50% sagebrush cover. Hens usually nest near the lekking grounds, but some hens have been noted to fly as far as 20 miles to favorable nesting sites. But the quality of nesting habitat surrounding the lek is the most important factor in population success. Hens seldom nest in the most arid, open areas with less than 10% total shrub cover. They generally prefer relatively tall sagebrush with an open canopy for nesting. The importance of sagebrush in the diet of adult sage grouse is great and studies have shown that 62% of their total food volume of the year was sagebrush.

The species is in decline across its range due to habitat loss and has been recognized as threatened or near threatened by several national and international organizations. However, they have not yet been placed on the threatened or endangered species list. There is currently a great deal of discussion occurring in the Idaho government sector in regards to taking measures to keep the sage grouse from getting listed. Bruneau Dunes State Park could function as a “showcase” in the recovery program, yet most of the state’s attention has been focused elsewhere.

Reptiles: The reptiles present in the park are: sagebrush lizard, horned Lizard, western fence lizard and western rattlesnake.

Fish: The fish found in the park are: bass and bluegill.

Invertebrates: Significant invertebrates found in the park are: scorpion and dunes tiger beetle.

Cultural History: The area of Bruneau Dunes State Park was once inhabited by the Bruneau Shoshone who were a western band of the Northern Shoshone. The Bruneau Shoshone occupied southwestern Idaho, mainly south of Snake River along the Bruneau River. The Bruneau Shoshone camped on the banks of the Snake River in winter and would return to the Camas Prairies in late spring. They lived in small extended families surviving on small game, fish, roots, berries, and whatever else they could obtain by using their primitive tools, snares and weapons. A dietary staple for the tribes was the sugar-producing blue flower “camas”. The flower grows wild and abundantly in the high desert. Indian women would harvest the camas root and then prepare it into thin dry cakes. Indian culture was based upon the procurement of food. Things changed rapidly when the gold rush to Boise Basin brought settlers in after 1862. On April 12, 1866, Territorial Governor Caleb Lyons signed a treaty with the Bruneau Shoshones in order to obtain mining lands around Silver City in the Owyhee Mountains and lands in the Snake and Bruneau Valleys. However, the treaty went unratified, and the Fort Hall Reservation was set aside partly for the Bruneau Shoshone. In 1875, a small part of the upper Bruneau was included in the Duck Valley Reservation, set aside for Western Shoshone and Northern Paiute bands. Some of the Bruneau Shoshone used this reservation as well.

Local History: Tradition in the Bruneau area claims that Bruneau was either named by its French translation of ‘brown water’ or after a French explorer by the name of Jean-Baptiste Bruneau. Gold and silver discoveries beginning in 1862 brought farmers and ranchers, as well as miners and merchants, to southern Idaho. Herds of cattle came to Idaho’s mining camps during the gold rush, and most of the better rangeland was stocked not long after. Caleb Lyon’s treaty would have left most of the Bruneau country for the Indians. Only the lower valley would have been relinquished to white ranchers. But as a result of Lyon’s efforts to treat them decently, Bruneau John and some of his associates remained friendly to white ranchers who began to settle in Bruneau Valley after 1870. Small ranches and farms began to spring up around the waystations. Thousands of cattle grazed in the Bruneau country without too much competition until sheep herders began to move in as well. By the spring of 1887, much of the upper Bruneau desert was overgrazed by sheep and ruined for cattle, and extremely dry years in 1888 and 1889 made matters worse. At the same time, good cattle markets in the Great Plains (a result of severe winters in 1887 and 1888 that wiped out most of the plains cattle herds) led to considerable export of southern Idaho cattle to Montana and Wyoming. Finally a terrible winter (December 1889 to February 1890) devastated cattle ranches in southern Idaho, although some of the Bruneau holdings fared somewhat better. But large cattle enterprises began to give way to smaller ranch operations in the Bruneau country. At the same time, John Wilkins began to develop a small band of horses into a large herd that enabled him to supply important national horse markets on a big scale. His daughter, Kitty, gained a national reputation as the “Horse Queen of Idaho” after taking over the enterprise. Basque sheepmen also entered Bruneau Valley after 1890. Frank Ypariaguirre expanded northward from Elko into the Bruneau and Snake River plains in 1891, and others soon followed. At the same time, placer mining at Rowland in the Upper Bruneau drainage brought in still another element. By 1900 the Bruneau region had a more diverse economy.

With the completion of C.J. Strike Reservoir in 1952, flood irrigation began which raised the water table and formed the small lakes and wetlands adjacent to the Bruneau Dunes. The lakes at the time were on BLM land and the Idaho Department of Fish and Game began to stock them with fish. The area soon became a popular recreation site.

Park History: In 1967, the newly created IDPR purchased 4,200 acres around the Bruneau Dunes from the BLM under the Recreation and Public Purposes Act. Construction then began on Broken Wheel campground and the visitor center. Another 600 additional acres were added in 1968 to create a “buffer zone.” The park was opened as Bruneau Dunes State Park in 1970. In the summer of 1972, NASA did a study of the vortex crater on Bruneau Dunes. The astronomy observatory was completed in 1998. The Eagle Cove campground was added in 2001.

Recreation Activities:

Camping: Idahoans love to camp in the mountains and forests of Idaho. But most of those campgrounds (Forest Service) are only open from Memorial weekend to Labor day weekend. So where do people go in the off-season? Part of the answer is Bruneau Dunes. Because of its lower elevation level, the climate at Bruneau Dunes State Park can be quite mild for most of the year and it remains open for camping all year long. Camping at Bruneau Dunes is most

popular during the shoulder seasons of late spring and early fall. With 114 individual campsites, 5 group camping sites and 2 camping cabins available there is plenty of room for camping. However, on the weekends in those shoulder seasons, reservations are advisable, because the campgrounds do fill up.

Picnicking: Bruneau Dunes State Park has 3 day use areas available for picnicking. The visitor center area has one picnic table and a nice shaded lawn for those who wish to just sit and take in the panoramic view of Eagle Cove and the dunes. The observatory day use area has 6 individual picnic tables available and some of these have their own shade shelters. Finally the Lake day use area has 4 individual picnic tables available. There are three group shelters available at the equestrian camp, Eagle Cove campground, and the Lake day use area, respectively.

Fishing: The lakes provide an excellent bass and bluegill fishery. Sport fishing is popular at the lakes, from the shore or from non-motorized boats, canoes, rubber rafts, or float tubes.

Boating: Only non-motorized boating is allowed on the Lakes and all watercraft must be hand launched.

Swimming: Although it isn't a designated swimming place, the lake at the Lake day use area has sort of a beach where this activity is suitable.

Trails: Bruneau Dunes State Park has about 22 miles of trail all of which is open to hiking and some are designated for horseback riding.

Birding: Bruneau Dunes is home to a wide variety of songbirds, waterfowl, shorebirds, and birds of prey. The diverse habitats of sagebrush steppe, water, and sand dunes converge into one area making this a unique habitat for a variety of birds. Often great horned owls can be viewed roosting in the taller trees in the Broken Wheel campground. Also at Broken Wheel campground, in the evening twilight, the night hawks put on a spectacular show in the skies during their feeding time.

Astronomy: The Steele-Reese Education Center, which includes the observatory, is open to the public at dusk each Friday and Saturday night from April through mid-October. The observatory is one of the largest in the Northwest and it is located in an ideal location to bring some awesome sights to the public. The observatory is far enough away from large population centers to still have dark skies and less air pollution. The rotating building houses an amazing reflector, nick-named "The Obsession." This is because it quickly becomes an obsession to see celestial objects in the sky through this magnificent custom-made 25" reflector telescope. As the sky darkens, local astronomers present a multimedia introduction to the night sky in the

Please Remember

- There is a \$5.00 per vehicle per day fee required for access to the park even if no one is collecting the fee at the entrance gate.
- Open fires are allowed only in the fire rings and grills.
- Motor vehicles must stay on established roadways and are not allowed on the dunes.
- Personal floatation devices are required for any water craft on the lake or river.
- Dogs must be on a leash at all times, and are not permitted in the buildings.
- All watercraft must display a current invasive species decal.

comfort of an indoor auditorium. This presentation is suitable for adults and children,. Once the stars begin to twinkle overhead, one can move to the rotating observatory where you can gaze at planets, stars, galaxies, and nebulae. You can also view the heavens using a variety of other equipment, including retractor and catadioptric telescopes, and a set of naval binoculars that are referred to as the “big eyes.” Viewing fees are \$3.00 per person (children under 5 are free).

Sand sports: Gliding and sliding on the huge Bruneau Dunes is a thrill any time of year. Sand boards, plastic sleds and saucers work best. So not bring cardboard.

Visitor Center: Inside the visitor center there are a number of exhibits and interpretive displays about the dunes and the plants and wildlife that can be found in the park. There are a number of museum style mounted specimens to examine. A DVD about the park is continuously playing in a loop for visitor viewing. There is a nature store offering souvenirs, gifts, books, and star charts. Ice cream and other treats can also be purchased. You can also rent sleds and saucers for sand sliding as well. The visitor center also has some fascinating fossil bones such as laminated mammoth molars and a sabertooth tiger skull with both canines broken off.

Resource Management Issues: As a park that is classified as natural, a higher priority needs to be placed on restoration of the ecosystems to a more natural state. The park natural condition has been seriously altered by noxious and invasive species. Russian olive, tamarisk, puncture vine, rush skeleton weed, cheat grass and Russian thistle (tumbleweeds) are present. Russian olive has become more-or-less acceptable because it is somewhat ornamental and provides necessary shade. However, it often invades riparian habitats where overstory cottonwoods have died. But the other noxious and invasive species are unacceptable in a natural park and are in need of eradication. In particular, one could say that the park is infested with chest grass and Russian thistle.

Some of the trees around the smaller lake are salt cedar or tamarisk. This is a non-native, invasive species. They were introduced from Asia in the late 1800s. Tamarisk grows in dense, nearly impenetrable thickets. It also is well-adapted to alkaline (salty) soils. Tamarisk plants are thriving in the alkaline soils and replacing native vegetation, altering the ecosystem. Tamarisk displaces native vegetation such as cottonwoods, willows, and adjacent dryland plant communities. They provide poor habitat for wild animals and birds. Their foliage and flowers provide little food value for native wildlife species that depend on nutrient-rich native plant resources. They increase wildfire hazards. Studies have shown that a mature tamarisk can uptake nearly 200 gallons of water a day. Both the National Park Service and the Bureau of Land Management have active programs for eradication of Tamarisk.

Lands that are deteriorated from drought or overgrazing, are frequently invaded and dominated by Russian thistle. They grow most often in cleared disturbed areas. They invade the edges of paved roadways where drainage provides the needed moisture. After seeds mature in late fall, the plant stem separates from the root and the plant is then blown by wind. Seeds fall to the ground as the plant tumbles. The tendency of dead plants to collect along fence lines and buildings creates a fire hazard. During a fire, ignited plants can blow across fire lines and make fighting fire more difficult. These weeds are very unsightly and detract from the beauty of the park. There are tremendous buildups of the dried remains of these tumbleweeds on the

backside of the dunes.

Cheatgrass was introduced to North America through contaminated grain seed, straw packing material, and soil used as ballast in ships sailing from Eurasia. This first occurred between 1850 and the late 1890's. During this time, abusive use of rangelands, coupled with drought, left many Great Basin rangelands in poor condition. Cheatgrass was able to occupy areas where the native vegetation had been reduced, beginning its persistent march across the landscape. Because cheatgrass stands dry out by mid-June, fires are more likely to occur earlier in the season. These mid-summer fires are tough on native forbs and grasses. Cheatgrass seeds drop prior to fires and will germinate with fall precipitation. This gives rise to dense, continuous stands that make additional fire ignition and spread more likely. Fire return intervals have gone from between 60-110 years in sagebrush dominated systems to less than 5 years under cheatgrass dominance. With every reoccurring fire, cheatgrass becomes more dominant and expands its range further.

The landscaped lawn areas at the park are in terrible condition and are getting worse. Further, the trees in the Broken Wheel campground are starting to look drought stricken. Weeds such as puncture vine are now becoming invaders in the lawns making any barefoot activity hazardous. Several park manager reports have identified this issue and state that it is an inadequate water rights problem and have recommended development of a new irrigation plan. The landscape at Broken Wheel campground and the Observatory day use area is now in need of significant rehabilitation.

Suggestions for the Future:

- Resurface all existing paved surfaces. The paved surfaces at the park are in poor condition and are in need of resurfacing. A particular section of the road to the main dunes has been in a state of disrepair for about 20 years. Consider paving all existing gravel roads and parking lots.
- Solve the water rights issues and rehabilitate the landscaping at the Broken Wheel campground and the Observatory day use area.
- A program of tamarisk removal should be started with the goal of completely eradicating this plant from the park. Chemical methods for eradicating tamarisk involve cutting the stump two inches above the soil surface and treating it with herbicide within minutes. Another herbicide can be applied near the base of the trunk when the bark is not wet or frozen. Tamarisk foliage can also be sprayed with herbicide in the fall. Unfortunately, re-growth often appears with any of these methods and re-treatment is necessary to kill the shrub.
- Consider beginning periodic cheat grass treatments. Experts recommend an integrated approach that involves killing and removing cheatgrass. This sometimes calls for spraying herbicides to kill cheatgrass before it produces seeds and then replanting the affected area with something else, such as crested wheatgrass.
- Consider periodic tumbleweed eradication. It is important to begin this task when the plants are young and green. They should be manually removed and the area should be treated with an herbicide to prevent regrowth. All dead, tumbling, and accumulated plants should be gathered into piles in the off-season and burned.
- Consider starting a restoration program that includes sagebrush planting. The Idaho

Department of Fish and Game already has an active program where they seem to have a list of project areas. Attempt to get Bruneau Dunes State Park included in the projects. Or attempt to directly obtain seedlings and seed and develop a volunteer program to begin this important restoration work.

- It has been observed that park staff occasionally park a vehicle and stand at the entrance in order to assure compliance with entry fee payment requirements. IDPR should consider installing an entrance station for this purpose.