

## ASKED & ANSWERED

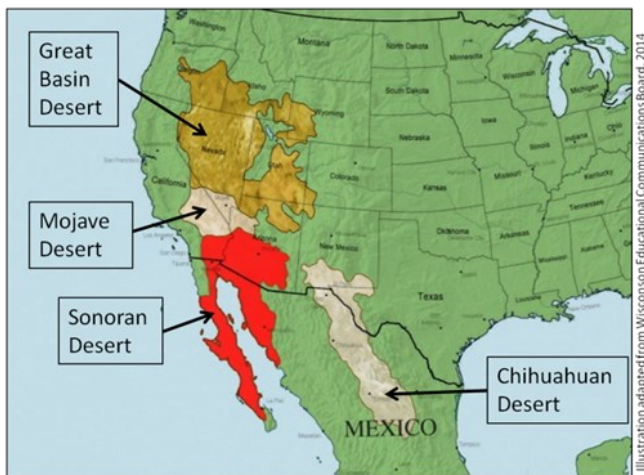
### WHAT DESERT IS THIS?

by *Jamie Leathem, Restoration Coordinator*  
*Osoyoos Desert Society*

The southern tip of the Okanagan Valley features a unique desert environment, and visitors to the Osoyoos Desert Centre often ask “What desert is this?” To answer the question, it can be helpful to first take a look at what deserts we are not a part of.

A common misconception is that our dry, shrub grassland is part of the Sonoran Desert. But in fact we are far from it – both geographically and in terms of climate and resident species. The misunderstanding likely arose because the arid lands of the South Okanagan were once classified as part of the “Upper Sonoran Life Zone,” by biogeographer C. Hart Merriam. Merriam created a system of “life zones” to classify the broad vegetation zones in North America. Extrapolating from his studies in and around the actual Sonoran Desert, he included any area with antelope-brush in the “Upper Sonoran” zone because these shrubs grow in high elevation areas near the Sonoran Desert (though not in it). Though his work was tremendously useful and became foundational to our modern-day concept of biomes, it did not apply particularly well to many parts of the continent and “Upper Sonoran” is no longer a useful classification, especially in our area.

The South Okanagan is not, nor ever was, part of the Sonoran Desert. The map below illustrates just how far from us the Sonoran desert is (in red).



At a much lower latitude than us, the Sonoran Desert has a climate and vegetation unlike anything we have here. Located in the American Southwest, it is one of three hot deserts in North America, along with the Mojave and Chihuahuan Deserts. Though climate varies dramatically across its considerable area (over 260,000 sq. km) because of factors like elevation and proximity to the Pacific Coast, the Sonoran Desert remains considerably warmer than the South Okanagan. There is a reason snowbirds head to Arizona for the winter! Summer temperatures in this subtropical area are often between 40°C and 48°C, while in winter, valley bottoms only rarely experience frost. Compare this to our often snowy winters in the South Okanagan and average summer temperatures of 28-32°C. Precipitation regimes are also very different. The driest parts of the Sonoran get only 3 inches of rain per year (75 mm) in two seasons: once in late winter and again as short but monsoon-like deluges in summer. In contrast, the driest parts of the South Okanagan valley receive 10-12 inches of precipitation annually (250-300 mm), mostly in the colder months as rain or snow.

If there is any lingering doubt about our association with the Sonoran, one look at the plant life should put that doubt to rest. The Sonoran Desert landscape is dominated by leguminous trees (e.g. acacias and other trees in the Pea family) and large columnar cacti, like the saguaro. There are over 300 species of cactus in the Sonoran Desert region, some of which can grow to over 20 m tall. Compare this to our local landscape dominated by low shrubs, grasses and one cactus species – the tiny brittle prickly-pear (*Opuntia fragilis*) – with a dazzling maximum height of 20 cm! The biggest and most well-known cactus in the Sonoran Desert is the saguaro (*Carnegiea gigantea*) and while its likeness may be painted on a few signs around Osoyoos, that’s the closest you’ll come to finding one here.

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Other Sonoran cacti include barrel cacti (*Ferocactus* and *Echinocactus* spp.), hedgehog cacti (*Echinocereus* spp.) pincushion cacti (*Mammillaria* spp.) and cholla cacti (*Opuntia* spp). The Sonoran has prickly pear cacti as well – around 18 species – though not the species we have here. Most common is the Engelmann prickly-pear (*Opuntia engelmannii*) which grows up to 1.5 m tall (and is probably easier to avoid stepping on than our species!). Other common succulents include agave (*Agave* spp.), yucca (*Yucca* spp.) and sotol (*Dasylirion* spp.). The Sonoran landscape also supports several low shrubs like creosote bush (*Larrea tridentata*) and ocotillo (*Fouquieria splendens*) and legume trees like palo verde (*Parkinsonia* spp.), catclaw (*Acacia* spp.) and mesquite (*Prosopis* spp.). These resourceful trees survive by developing very deep root systems which are always in contact with the water table deep below the sandy soil.

Some visitors ask if our area is considered part of the Great Basin Desert (in gold on map). Though it is more similar to our region than the Sonoran, the Great Basin Desert does not extend into British Columbia. In the rain shadow of the Cascade and Sierra Nevada Ranges, the Great Basin Desert covers parts of eastern Oregon, southern Idaho, east central California and most of Nevada. It is a cold desert, meaning freezing temperatures are common and most of the precipitation falls in winter months as rain or snow. Sound familiar? However, average high temperatures in summer are 28-32° C, a few degrees warmer than ours of 25-29° C, and precipitation at low elevations is also slightly less than ours. These slight climatic differences, combined with our relative proximity, make it possible for us to have several species in common with the Great Basin Desert. After the glaciers that carved out the Okanagan Valley retreated and climate subsequently warmed, several plant and animal species migrated north from the Great Basin Desert into British Columbia as more areas became hospitable to them. One such species is big sagebrush (*Artemisia tridentata*). This familiar shrub is even more dense in the Great Basin De-

sert than it is here. Rabbitbrush (*Ericameria nauseosa* – recently changed from *Chrysothamnus nauseosus*) and antelope-brush (*Purshia tridentata*) also have origins in the Great Basin Desert, though the latter is actually less common than here and known as bitterbrush (emphasizing the importance of including latin/scientific names when comparing flora across regions!). Other shared species include arrow-leaf balsamroot (*Balsamifera sagittata*), Great Basin wild rye (*Leymus cinereus*) and golden-aster (*Heterotheca villosa*). We also, unfortunately, share invasive plants like knapweed (*Centaurea* spp.) and cheat-grass (*Bromus tectorum*).

Despite these shared species, the dominant vegetation of the Great Basin Desert is quite different from the South Okanagan's. Shrubs like black-brush (*Coleogyne ramosissima*), shadscale salt-bush (*Atriplex confertifolia*), greasewood (*Sarcobatus vermiculatus*), Mormon tea (*Ephedra viridis*) and the occasional yucca dominate the landscape. Only one cactus occurs in the Great Basin Desert, the Plains prickly-pear (*Opuntia polyacantha*). It is a close relative of the brittle prickly-pear and hybrids of the two species (*Opuntia x columbiana*) occur in Washington and British Columbia.

So, when all is said and done – what is our desert environment called? In terms of ecoregions, it is the northernmost extension of the plant community of the semi-arid steppe plateaus that extend into the western United States. A bit long-winded? At the Desert Centre we typically refer to it as a shrub-steppe semi-desert, or as the antelope-brush ecosystem. No matter what you call it, however, this habitat is very special and one of the rarest and most endangered ecosystems in Canada. It supports numerous species that occur nowhere else on Earth, as well as many species at the northern edge of their range – populations which hold genetic diversity vital to adapting to a changing climate. As stewards of this valuable landscape we all play an important role in its protection and future survival.