

Comments by Dr. Susan Harrison at Napa Town Hall Meeting, December 19, 2014

What's special about the Berryessa-Snow Mountain region, from a biologist's perspective, is that it captures in a moderate-sized area (350,000 ac) a great deal of what makes California special, and which has not yet been similarly protected and appreciated. California is one of the world's top 25 biodiversity "hotspots", identified by having thousands of native species found nowhere else. Among all US states, it has by far the highest biological diversity by any measure – plants, animals, vegetation types, and species found nowhere else. And most people don't realize that the majority of California's unique biological diversity resides not in our famous coastline or high Sierras, which are so well appreciated, but in our interior foothill environments, which (as you know, because you live here) are rich mosaics of conifer forests, oak woodlands, grasslands, and chaparral.

The Berryessa-Snow Mountain region is emblematic of that diversity. It contains around 1700 plant species, several dozen plant species found nowhere else, and around 80 distinct vegetation types – making it more diverse than many entire US states (not to name any names!). For over 50 years, evolutionists and ecologists have recognized the BSM region as a living laboratory for understanding the origin of and maintenance of biological diversity. To borrow a metaphor from the great evolutionist Ledyard Stebbins, this region is both a 'cradle' and a 'museum' – a 'cradle' where new species are born in response to unique environmental conditions, and a 'museum' where ancient lineages have survived for tens of millions of years. I'll briefly mention three important sources of this region's diversity.

One is geology. In the BSM region you can easily see dramatic outcrops of numerous bedrock types including sandstone, basalt, gabbro, and serpentine – again, more diversity than you can find in many entire states. These outcrops are the visible remnants of the plate tectonic collisions that built western North America. These rocks were uplifted and exposed by the faulting that (as you know) continues in this region today. Studies of these rocks have helped elaborate the story of global plate tectonics. Geologic diversity is an important cause of the plant diversity of the BSM region. One can see striking boundaries between blue oak woodlands on fine-textured sediments, chamise chaparral on sandstone, leather oak chaparral on serpentine, and so on. Serpentine – our state rock – deserves special mention. It's a bluish-green rock derived from the earth's mantle that is chemically harsh and supports many of the region's most unusual species. Many of these species appear to be young and rapidly evolving and are only found in a handful of locations.

A second important element is the BSM region's strongly seasonal climate, intersecting with its steep angular topography, giving rise to extreme contrasts between adjacent microclimates. This is important not only to winegrowers, but also to native species. You can go from oak forest on the cool north side of a ridge to grassland on the hotter south side, or from chaparral on the lower slopes of Snow Mt to red-fir forest only a short way above, and find dramatic differences in animal as well as plant life.

A third important element, especially as we look ahead, is the connectivity of the regional landscape from north to south and from low to high elevation, still almost unbroken by major development and land-use change. This connectivity makes it a rich region for migratory songbirds and for large animals such as tule elk and mountain lion. Connectivity has been

essential in the geologic past, and will be truly critical in the near future, for allowing plant and animal species to move around and survive rapidly changing climates.

In summary, this monument proposal gives us the opportunity to protect not only a rich tapestry of biological diversity, but the processes that generate and maintain our biological heritage. It's near major cities where scientists and the general public can study and appreciate it. **In my subjective opinion, the scale of this monument could not be significantly smaller and still protect the ecological diversity and connectivity that are its fundamental attributes.** I offer these remarks on behalf of dozens of other scientists who support monument designation for this region.