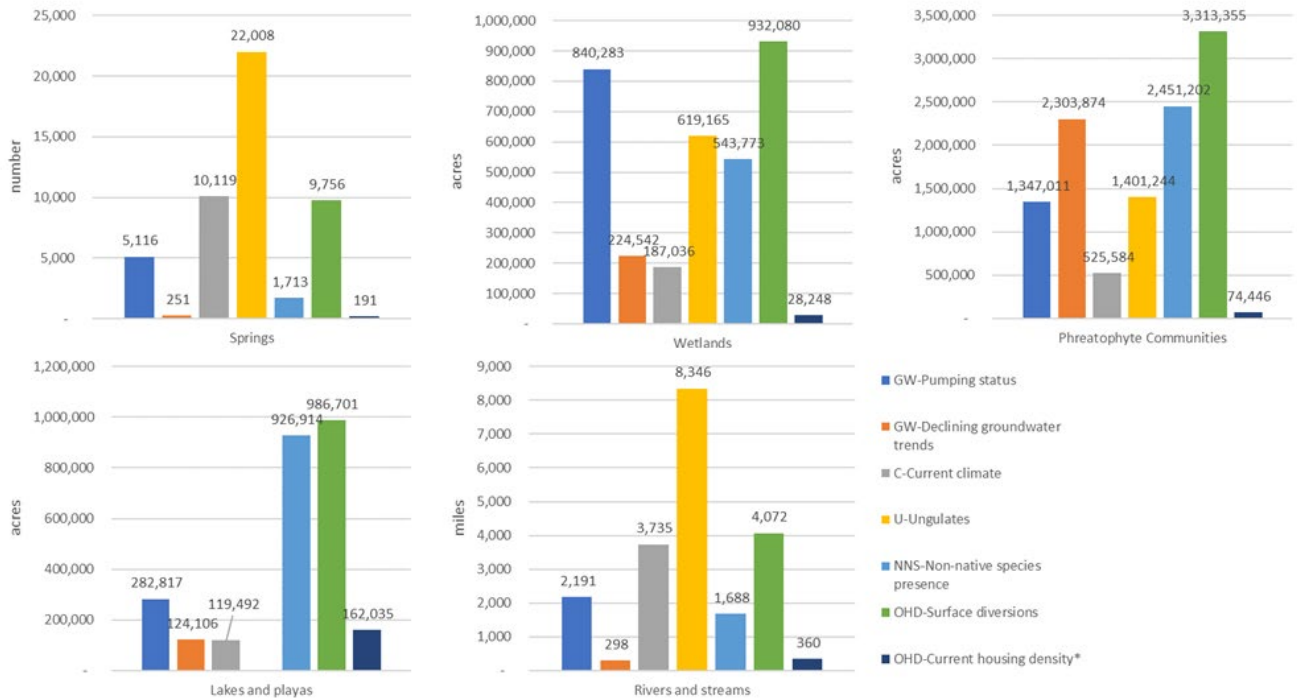


## Review of results of Stressor and Threat Assessment of Nevada Groundwater Dependent Ecosystems

- Fact sheet, Executive Summary, and Report are available at <https://www.groundwaterresourcehub.org/where-we-work/nevada/nevada-gde-stressor-threat/>
- Completed in May 2022
- **Groundwater dependent ecosystems (GDEs)** are *ecosystems that rely on groundwater to maintain ecological structure and function*, including springs, wetlands, phreatophyte communities (plants with roots that can tap into groundwater), rivers and streams, and lakes and playas.
- **Stressors:** Currently impacting GDEs
- **Threats:** Potentially could impact GDEs in the future
- Key outcomes (see Report for more detail on methods and results):
  - **Stressor S1 - Groundwater pumping status:** This stressor is related to the pumping status of Nevada's 256 hydrographic areas, which are the administrative areas for groundwater in Nevada. About 20% of GDEs are in hydrographic areas that are over-pumped, which can put them at risk of having groundwater they use captured by excessive groundwater withdrawals
  - **Stressor S2 – Declining groundwater trends:** 39% of 6,536 analyzed wells had significantly falling groundwater level trends over water years (WY) 1984-2021
  - **Stressor S3 – Current climate:** Over 10,000 springs and over 3,700 miles of groundwater-dependent rivers and streams are at high risk for current droughts and climate stresses because they are often located in recharge areas with short flow paths
  - **Stressor S4 – Ungulates:** Almost 90% of springs and over 70% of rivers and streams are in areas that ungulates are expected to access, which is likely an overestimate because in some of these areas the stressors and threats are being mitigated or reduced by management
  - **Stressor S5 – Non-native species presence:** Based on reported data on non-native species well-known to negatively affect GDEs in Nevada (see Appendix L in the Report), over 60% of lakes and playas are at high risk from the presence of non-native species; springs had the lowest percentage (7%) at high risk which contradicted literature that has found non-native species to affect springs-dependent taxa, so result may reflect lower rate of monitoring and reporting of non-native species at springs.
  - **Stressor S6 – Nearby surface diversions:** Based on locations of surface water points of diversion in the Nevada Division of Water Resources database, over 60% of phreatophyte communities and groundwater-dependent lakes and playas are at high risk for the surface water points of diversion stressor risk factors, which can lead to the decline and elimination of GDE species
  - **Stressor S7 – Housing density:** Based on housing densities for 2010 in the Bureau of Land Management's Rapid Ecological Assessment (Comer et al. 2013), about 10% of lakes and playas are at moderate to high risk for the housing density stressor risk factor.
  - **Threat T1 – Groundwater appropriation status:** This threat is related to the appropriation status of Nevada's 256 hydrographic areas, which are the administrative areas for groundwater in Nevada. At least 40% of all GDE types are in hydrographic areas that have more water rights committed than available groundwater.
  - **Threat T2 – Proximity to GDEs to potential withdrawals:** This threat is based on considering where shallow groundwater exists near GDEs using data from Lopes et al. (2006). Over 70 percent of wetlands, phreatophyte communities, and lakes and playas are at high risk for threats from potential groundwater withdrawals; loss of access to groundwater can lead these GDEs to transition to more fire-prone systems with less ecological value

- **Threat T3 – Future climate:** Using downscaled data from global climate models, all hydrographic areas are projected to have more droughty conditions in the future (2022-2060), which means that all of Nevada’s GDEs are likely to encounter less water availability from the atmosphere; GDEs in Southern Nevada are at especially high risk.
- **Threat T4 – Road density:** Using road density data from the TIGER database of the U.S. Census Bureau, very few GDEs are at moderate to high risk of the road density non-native species threat risk factor because many GDEs are in rural areas where the normalized road density values are low.
- **Threat T5 – Housing density increase:** Based on projected increased housing densities between 2060 and 2010 in the Bureau of Land Management’s Rapid Ecological Assessment (Comer et al. 2013), about 6% of lakes and playas are at moderate to high threat risk for the increased housing density stressor risk factor.

## Stressor risk factors



# Threat risk factors



\*Note: Ungulates were considered both a stressor and threat so data on ungulates shown on Threat risk factors is identical to the Stressor risk factors

## References:

- Comer P, Crist P, Reid M, Hak J, Hamilton H, Braun D, Kittle G, Varley I, Unnasch B, Auer S, Creutzburg M, Theobald D, Kutner L. 2013. Central Basin and Range Rapid Ecoregional Assessment Report. Prepared for the US Department of the Interior, Bureau of Land Management. 168 pp + Appendices. Available at [https://landscape.blm.gov/REA\\_General\\_Docs/CBR\\_1\\_ReportBody.pdf](https://landscape.blm.gov/REA_General_Docs/CBR_1_ReportBody.pdf) (accessed 11/2/2021)
- Lopes TJ, Buto SG, Smith JL, Wellborn TL. 2006. Water-Table Levels and Gradients, Nevada, 1947-2004. Scientific Investigations Report 2006-5100. Carson City: US Geological Survey. 35 p. Available at <https://pubs.usgs.gov/sir/2006/5100/> (Accessed 8/24/20).