STRATEGY 3

Enact policies to address current excessive groundwater withdrawals and overappropriation

Why this strategy is needed

Administration of groundwater in Nevada is the responsibility of the Nevada Division of Water Resources (NDWR) and is managed by hydrographic area, with each of the 256 hydrographic areas across the state having an assigned perennial yield (PY) that is used as general guidance for evaluating water available for use in each hydrographic area (Nevada State Engineer Order 1308). Most PYs were estimated in the 1950s to 1970s and were based on groundwater discharge, which Bredehoeft (2002) noted is mostly evaporation from playas and evapotranspiration of phreatophytic plants. Thus, withdrawals can theoretically be allowed to the rate of natural discharge, which is water used by GDEs, so GDEs could be progressively eliminated as water stored in an aquifer reaches a new equilibrium. Nevada's total PY is ~2.5×10^9 m^3 (2 million acre-feet (af)), of which ~2.0×10^9 m^3 (1.6 million af) was used for human purposes in 2015 (Dieter et al. 2018). According to Wilson (2019), 50% of the hydrographic areas were fully- or over-appropriated, which means that water rights were committed at or above the PY in those hydrographic areas. Of these, 62 were over-appropriated by more than 200%, and 49 of the hydrographic areas had more groundwater withdrawn than the PY (Wilson 2019). Saito et al. (2022a) found that 20% of Nevada GDEs are in over-pumped hydrographic areas, and at least 40% of each GDE type (i.e., springs, wetlands, phreatophyte communities, rivers and streams, and lakes and playas) are in hydrographic areas that are over-appropriated. To reduce risks to GDEs, overuse and overappropriation of groundwater needs to be brought back to sustainable levels. In addition, policies that affect land management agencies such as the BLM may help address excessive groundwater withdrawals by land uses such as mining.

Examples of actions associated with this strategy

- Enable voluntary permanent retirement of groundwater rights, especially those that protect GDEs
- Incentivize the protection of GDEs in policies to reduce excessive groundwater withdrawals and overappropriation
- Set limits or allocations for groundwater consumption
- Enact policies to facilitate or incentivize reduction in water demands (e.g., water conservation, crop switching, new technologies, etc.)

Challenges and considerations

Changing water law or regulations is inherently difficult, particularly when focusing on issues of overappropriation and excessive withdrawals, as there are existing economic systems built on the current structure. However, stakeholders and legislators working together may be able craft policies that include protections for GDEs that have a higher likelihood of success. Through this process, it may be hard to get buy-in from senior water right holders if potential actions might appear to challenge prior appropriation and litigation against policies that restrict existing water rights should be anticipated. To be effective, policy design processes will require time and persistent dialogue amongst stakeholders that may have very different perspectives, including those prioritizing conservation aspects and others focused on economic growth opportunities. Science and education strategies will be important to incorporate along with this policy strategy as part of this process. Despite these challenges, because there could be lag times between when pumping is reduced to seeing reduced impacts at GDEs, these policies should be implemented as soon as possible.

Qualitative assessment of the effectiveness of Strategy 3's ability to reduce the impacts of each GDE stressor and threat.

STRESSOR RISK	EFFECTIVENESS
S1: Groundwater pumping status	*Highly Likely*
S2: Declining groundwater level trends	*Highly Likely*
S3: Current climate	
S4: Ungulate impacts	
S5: Non-native species presence	
S6: Surface diversions	
S7: Urbanization	
THREAT RISK	**EFFECTIVENESS**
T1: Appropriation status	*Highly Likely*
T2: Potential withdrawal proximity to GDEs	*Somewhat Likely*
T3: Future climate	*Somewhat Likely*
T4: Non-native species spread	
T5: Future urbanization