

## **Integrating Science and Policy to Protect and Restore Groundwater-dependent Ecosystems**

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A variety of native species and ecosystems depend on groundwater to meet a significant portion of their water needs. This groundwater-dependent biodiversity can be impacted or lost if groundwater is not managed in ways that provide an adequate supply of high quality water. Despite the essential role played by groundwater, its abundance, connection to ecosystems, and quality are increasingly threatened by the water demands of growing populations. Ensuring that groundwater management policies address ecological concerns requires integrating sound science into water management planning. In Oregon, The Nature Conservancy is combining scientific assessments with a comprehensive policy review to identify gaps in groundwater protection and to develop strategies to meet the groundwater needs of biodiversity. Our scientific assessment involves developing a statewide map of Groundwater Focus Areas, which are priority conservation areas where groundwater is critically important to biodiversity, and identifying the primary threats to the quantity and quality of groundwater in these areas. Across the state, we conducted a GIS analysis to determine where ecosystems (lakes, rivers, wetlands, caves, and springs) and key species depend upon groundwater. At each of these areas, we evaluated the risk posed by existing and future water use activities to the availability and quality of groundwater. Potential future threats to the groundwater quantity were evaluated based on the presence of groundwater wells and projected future pumping rates. Potential future threats to groundwater quality were based on both the susceptibility of a site to groundwater contamination and its vulnerability given existing land uses. Our policy review evaluates the current state laws and policies directing groundwater management. The assessment includes a review of key water statutes and case law that have a direct impact on conservation and protection of groundwater-dependent ecosystems and species, and the current interpretation and implementation of those laws. This information is being used to evaluate the effectiveness of the current legal framework for protecting groundwater-dependent biodiversity and to determine gaps and opportunities. The scientific and legal analyses are integrated to identify where land-use activities pose threats to groundwater-dependent ecosystems and whether the existing policies and statutes are adequate to address these threats. This synthesis of the scientific and policy analysis is being used to prioritize groundwater protection strategies and to inform future groundwater management decisions. Example strategies include working with local communities to develop groundwater management and monitoring plans, creating legally-protected groundwater or spring flow rights to benefit native species and ecosystems, and reducing chemical inputs to groundwater from agricultural areas, lawns and gardens, and septic systems.