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VIA EMAIL AND CERTIFIED MAIL
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RE: Approve Groundwater Rules That Better Protect Groundwater and Wildlife

Dear Ms. Hartt and the Oregon Water Resources Department:

On behalf of the Center for Biological Diversity, I submit these comments on the Oregon Water Resources Department's ("OWRD") proposed changes to groundwater permitting and allocation rules ("Proposed Rule").

As our region faces an ever-increasing demand for groundwater amidst the intensifying effects of climate change, improving Oregon's groundwater permitting rules is of the utmost importance. Existing rules have resulted in over-issuance of groundwater permits and caused major groundwater-level declines across the state that have harmed rivers, streams, lakes, wetlands, and springs that rely upon inputs of cold, clean groundwater. This, in turn, has harmed groundwater dependent ecosystems and wildlife. Declining groundwater levels have also harmed existing surface water rights, including instream water rights for wildlife, and domestic well owners who rely on groundwater for drinking water and household use.

The Proposed Rule is a necessary first step to prevent further groundwater degradation and, in several ways, puts Oregon on a path to more sustainable permitting by: defining "reasonably stable" and preventing new permits from being issued if groundwater levels are not reasonably stable; establishing the amount and type of data needed to find that groundwater levels are reasonably stable and requiring denial of a permit if data is not available; and protecting senior surface water rights, including instream water rights for fish and wildlife, by requiring a full accounting of the impacts of proposed pumping on hydraulically connected rivers and streams.

Despite these necessary changes, the Proposed Rule fails to adequately address the issues caused by Oregon's over-allocated groundwater systems. Across Oregon, groundwater levels are falling at unsustainable rates due to overuse. While the Proposed Rule prevents the rate of decline from worsening, it does nothing to slow or stop the current rate of decline, nor does it address issues with permits in existence or permit applications in process at the time of the rule's adoption. As discussed further below, OWRD must (I) tighten language providing a major loophole for new permit applications, (II) reduce the rate of decline necessary to find "reasonably stable" groundwater levels, and (III) better protect groundwater dependent ecosystems and wildlife.

I. The Proposed Rule must not allow for the unsupported presumption that groundwater levels are reasonably stable for first permit application.

The Proposed Rule allows OWRD to assume, based on zero data, that groundwater is not over appropriated if there is no other known groundwater pumping in the area. Specifically, the Proposed Rule provides that if data is insufficient to show that groundwater levels are reasonably stable, OWRD will "presume that groundwater levels are not reasonably stable." However, the Proposed Rule goes on to provide a major loophole to that presumption, stating that it will presume groundwater levels are not reasonably stable "unless … groundwater has not yet been extracted or authorized for extraction from the groundwater reservoir, in which case the Department may presume that groundwater levels are reasonably stable."

OWRD must tighten this language by either: (1) requiring that, to presume groundwater levels are reasonably stable based on no groundwater extractions from the reservoir, it must be confirmed with sufficient data; or (2) removing the language in subpart B altogether.

II. The Proposed Rule must reduce the average rate of decline necessary to find that groundwater levels are reasonably stable.

Although the Proposed Rule defines "reasonably stable" groundwater levels and prevents new permits from being issued when groundwater levels are not reasonably stable, the definition is too generous. The definition of "reasonably stable" in the Proposed Rule includes "an average rate of decline of no less than 0.6 feet per year over any immediately preceding averaging period with duration between 5 and 20 years," and a maximum decline of 25 feet from a reference point to the year in which reasonably stable is evaluated.

An average rate of decline of 0.6 feet leaves room for groundwater sources to decline to severely degraded levels in only a few years, as a groundwater system can completely destabilize in only 1 or 2 feet decline. To remedy this issue, the rules must provide an average rate of decline that is lower than 0.6 to meet the definition of "reasonably stable."

III. The Proposed Rule must better protect groundwater dependent ecosystems and wildlife.

The Proposed Rule must do more to reverse the decades-long damage to groundwater levels and better protect groundwater dependent ecosystems ("GDEs") that support a vast array of wildlife in our state. In total, Oregon has about 3,479 square kms of groundwater-dependent wetlands, which is about 45.4% of the 7,660 square kms total wetlands mapped in Oregon, and over 1,200 plant and animal species in Oregon are obligately or facultatively dependent upon groundwater.[1] By taking a more proactive approach to protecting GDEs, Oregon could prevent myriad groundwater-dependent animals and plants from becoming endangered or threatened with extinction, obviating the need for listing under the Endangered Species Act.

[1] Oregon Atlas of Groundwater Dependent Ecosystems (2022) at 26, 40 available at https://www.groundwaterresourcehub.org/content/dam/tnc/nature/en/documents/groundwater-resource-hub/Oregon_Atlas_of_Groundwater_Dependent_Ecosystems_2022.pdf.

One major issue with the Proposed Rule is that it defines the term "Potential for Substantial Interference" to mean that use of groundwater "will cause streamflow depletion" and thus "may cause or may have caused substantial interference with a surface water source." By limiting this definition to apply only to streamflow depletion, however, the Proposed Rule fails to apply to situations where groundwater use may harm surface waters that lack streamflow, such as wetlands, marshes, fens, seeps, and other GDEs.

GDEs rely on groundwater for their structure, composition, and function.[2] These ecosystems include a broad range of aquatic habitat types that support a vast array of species that rely on groundwater for all or part of their life cycle. GDEs are characterized by their overwhelming biodiversity and their ecological importance, as they are often the only perennial sources of water in semi-arid or arid regions. GDEs also function as ecological refugia due to their climate-buffering capacity and resilience to short- and long-term climate variation.[3] Despite providing climate-resilient refugia habitat for many species, however, these ecosystems are particularly vulnerable to human impacts from groundwater overuse and hydrologic alterations.

Climate change and increased irrigation demand in Oregon will further stress groundwater sources that feed GDEs. Reliance on groundwater is already increasing rapidly in Oregon, where agriculture represents 85% of statewide water demand,[4] and this is expected to increase due to prolonged growing seasons and increased rates of evapotranspiration from climate change.[5] Most climate models project that precipitation will increase in winter but decrease in summer, which implies that the number of consecutive days without rain will increase during the dry season.[6] Some studies also suggest that precipitation events and dry periods will become more intense in the coming decades.[7]

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[2] Kløve, B., Pertti, A., Bertrand, G., Boukalova, Z., Widerlund, A., Goldscheider, N., et al. (2011). Groundwater dependent ecosystems. Part I: Hydroecological status and trends. *Environ. Sci. Policy* 14 (7), 770–781.

[3] Cartwright, J. M., Dwire, K. A., Freed, Z., Hammer, S. J., McLaughlin, B., Misztal, L. W., et al. (2020). Oases of the future? Springs as potential hydrologic refugia in drying climates. *Front. Ecol. Environ.* 18 (5), 245–253.

[4] Oregon Water Resources Department. 2015. Oregon Statewide Long-Term Water Demand Forecast. 76 p. Salem, OR.

[5] Oregon Water Resources Department. 2017. Oregon's 2017 Integrated Water Resources Strategy. Mucken A and Bateman B (eds.) 190 p. Salem, OR.

[6] Abatzoglou, J.T., R. Barbero, J.W. Wolf, and Z.A. Holden. 2014a. Tracking interannual streamflow variability with drought indices in the U.S. Pacific Northwest. Journal of Hydrometeorology 15:1900–1912.

Rupp, D.E., J.T. Abatzoglou, and P.W. Mote. 2017. Projections of 21st century climate of the Columbia River Basin. Climate Dynamics 49:1783–1799.

[7] Pendergrass, A.G., et al. 2020. Flash droughts present a new challenge for subseasonal-to-seasonal prediction. Nature Climate Change 10:191–199.

Rupp, D.E., L.R. Hawkins, S. Li, M. Koszuta, and N. Siler. 2022. Spatial patterns of extreme precipitation and their changes under ~2°C global warming: a large-ensemble study of the western USA. Climate Dynamics 59:2363–2379.

In Oregon, surface water evaporation is generally expected to increase as temperatures increase.[8] Even if changes in precipitation could increase the average net water balance (precipitation minus evaporation), the likelihood of drought, particularly during summer, will also increase as precipitation becomes more intense and seasonal.[9] Surface water in Oregon during the irrigation season is almost fully allocated,[10] so increased water demand or decreased surface water supply is likely to prompt additional groundwater development.

In August, when Oregon's streams often experience their lowest flows and warmest temperatures, cold-water groundwater inputs are ecologically important for the growth and survival of aquatic species. Because Oregon's mean August stream temperature is expected to increase in most streams by 10-20%,[11] it is especially important to protect groundwater inputs to provide cold-water refugia for anadromous fish and other species. Increased drought combined with invasive annual grasses will also change the fire regime in eastern Oregon, which will disproportionately harm springs, groundwater-dependent rivers, and riparian phreatophyte communities—deep-root plant communities that draw their water directly from groundwater.

As these effects of climate change further stress surface water levels and temperatures in Oregon, the demand for groundwater for irrigated agriculture and municipal use will become ever greater. Indeed, climate change will significantly affect irrigation practices and the availability and use of scarce water in Oregon. Bigelow and Zhang (2018) provided a direct assessment of climate adaptation through the lens of agricultural irrigators in Oregon.[12] Their findings highlighted how agricultural producers in Oregon have already begun acquiring supplemental irrigation rights, which give irrigators access to another source of water if they cannot withdraw the full amount of water granted to them through the primary water right from the primary source (e.g., if junior surface water users are regulated off in a given basin, a supplemental groundwater right could be used to make up the shortfall). But while this practice may allow irrigators to "adapt" to drought conditions or dwindling surface water levels by drawing water from another source, it will put added, increased stress on groundwater levels and GDEs.

Oregon's groundwater rules must go farther to protect GDEs and the wildlife who rely on them. Specifically, groundwater allocation "within the capacity of the resource" must adequately consider the beneficial value and capacity of GDEs.

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[8] Abatzoglou, J.T., and D.E. Rupp. 2017. Evaluating climate model simulations of drought for the northwestern United States. International Journal of Climatology 37:910–920.
[9] Oregon Climate Assessment 2023.
[10] Oregon Water Resources Department. 2017. Oregon's 2017 Integrated Water Resources Strategy. Mucken A and Bateman B (eds.) 190 p. Salem, OR.
[11] Isaak DJ, Wenger SJ, Peterson EE, Ver Hoef JM, Nagel DE, Luce CH, Hostetler SW, Dunham JB, Roper BB, Wollrab SP, Chandler GL, Horan DL, Parkes-Payne S. 2017. The NorWeST summer stream temperature model and scenarios for the western U.S.: a crowd-sourced database and new geospatial tools foster a user community and predict broad climate warming of rivers and streams. Water Resources Research 53: 9181-9205.
[12] Bigelow, D., and H. Zhang. 2018. Supplemental irrigation water rights and climate change adaptation. Ecological Economics 154:156–167.

In addition to considering whether groundwater sources are hydraulically connected to surface waters with streamflow when determining the "Potential for Substantial Interference" of a new groundwater permit, the Proposed Rule must adequately consider the connectivity of groundwater to other surface water features like wetlands, marshes, fens, and other GDEs without streamflow that could also be harmed by pumping.

Finally, only four governmental entities in the world currently have GDEs explicitly listed as a source for water management consideration, and Oregon is not yet one of them.[13] Oregon must protect our biologically diverse and ecologically important GDEs a conservation priority, particularly within the context of its groundwater permitting system.

Conclusion

Improving Oregon's groundwater permitting rules is long overdue, and the Proposed Rule changes must be implemented promptly to prevent further worsening of a severely damaged groundwater system. Adopting the Proposed Rule, however, should be the bare-minimum that OWRD does to correct the decades-long overallocation of groundwater permits, safeguard against the harmful effects of climate change, and put our state on a better and more responsible path to sustainable groundwater management for both Oregon residents and the wildlife that depend on these important water sources.

Sincerely,

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[13] Rohde M, Froend R, Howard J. 2017. A global synthesis of managing groundwater dependent ecosystems under sustainable groundwater policy. Groundwater 55(3):293-301.