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Statement on Oregon's Mule Deer Population Decline and Conservation Strategies
An Indigenous Perspective

My name is Dr. Cristina Eisenberg, and I live in Corvallis, Oregon and in Northwest Montana. I am Native American, of Raramuri and Western Apache mixed heritage. I am the former Associate Dean and Director of Tribal Initiatives at the Oregon State University College of Forestry and have a PhD in forestry and wildlife from OSU. I specialize in megafire and prescribed fire effects on wildlife habitat and predator/prey dynamics involving ungulates and large carnivores, examining these relationships using rigorous Western Science and Indigenous Knowledge. I have studied ungulate/carnivore/fire interactions for 20 years in the US and Canada, capturing and GPS-collaring elk and wolves for my research. I come from a ranching background going back many generations and am a hunter and a professional member of the Boone and Crocket Club. For many years I served on the board of the Society for Ecological Restoration and currently am a Sustainable Northwest board member. I served on the National Academy of Sciences Biodiversity Assessment panel, and have testified in the US Congress about the role of Indigenous Knowledge in managing natural resources for resilience and health.

ODFW and others have documented a population decline in mule deer in Oregon of 50% between 1980 and 2024. For Indigenous Peoples this is particularly concerning because in Oregon mule deer are a traditional Indigenous food. Treaty reserved rights provide Indigenous Peoples with the right to hunt and harvest traditional foods on their ancestral lands. The severe mule deer population decline is making it difficult for Indigenous Peoples to fully exercise their treaty rights. However, this is not the first time the mule deer population has declined sharply, nor is it the first time treaty rights have been challenged by mule deer scarcity.

Indigenous Peoples had been stewarding forests and the wildlife these forests contain since time immemorial. In Oregon, per archeological data, Indigenous presence goes back at least 20,000 years. This means that Oregon forests and the plant communities and wildlife they contain co-evolved with Indigenous stewardship of them. Indigenous stewardship did not involve predator hunting or control of predator populations by means

other than self-defense, which was rare. Indigenous Peoples and the game species they relied on for food coexisted with a robust large carnivore population.

When Euro-American settlers arrived in what is today called Oregon, they forcibly took land that belonged to Indigenous Peoples and proceeded to apply forest management practices that had failed in Europe, and didn't work well throughout North America. Specifically, this involved clear cutting forests and replanting them using a single species approach, at a high stocking density. This resulted in closed-canopy forests where there were once structurally diverse open forests. These closed-canopy forests contained an understory nearly barren of the shrubs and forbs that provide essential foods for mule deer and other ungulate species. Additionally, Euro-American settlers brought fire suppression. They suppressed wildfires and strictly prohibited the cultural burns widely practiced by most Indigenous Peoples in North America, and practiced by all Indigenous communities in Oregon. In many places cultural burning was punishable by death. Collectively these settler colonial natural resource management changes created unsustainably dense forests that provided degraded habitat for mule deer and other ungulates. These new forests were far less resilient to wildfire, drought, and other ecological stressors compared to those stewarded by Indigenous Peoples since time immemorial (Hessburg et al. 2019; Eisenberg et al. 2024). A further contributing factor to severe mule deer population decline in the 1800s was unregulated hunting by Euro-American settlers. The changes that occurred in Oregon occurred throughout North America, everywhere Indigenous Peoples and their stewardship practices were forcibly removed.

In the early 1900s mule deer populations in Oregon began to increase due to timber harvest combined with implementation of federal wildlife conservation policies and effective hunting regulations. However, in the 1980s and 1990s, the second mule deer decline was driven by a reduction in timber harvest, which created densified closed-canopy forests again. These mule deer population declines transcend Oregon and have occurred throughout mule deer range in North America.

Habitat is the main limiting factor on mule deer populations. In Oregon, the primary cause of mule deer decline is habitat change driven by drought, lack of forest thinning, and lack of cultural/prescribed burning, all of which result in a drastic reduction in the amount and nutritional quality of forage, and the nutritional carrying capacity (NCC) for mule deer (ODFW 2024). Inadequate forage reduces both maternal pregnancy and fawn survival rates (Bergman 2014).

While the influence of predation on the mule deer population is complex, it is usually compensatory, rather than additive (Forrester and Whittmer 2013). For example, poor habitat may cause mule deer to forage in “riskier” areas where they are more vulnerable to cougar predation (Cain et al. 2024). Because of the compensatory nature of carnivore predation on mule deer and other ungulates, intensive predator control actions are ineffective at increasing ungulate populations. Further, intensive predator control disrupts large carnivore social structure, actually leading to increased predation. These relationships are highly complex, as Dr. Wielgus will report.

Our forest management system is broken, and the North American Model for wildlife conservation, which involves a top-down, command and control approach to sustaining game populations is ineffectual in this time of rapid global change and complex ecological relationships (Mahoney et al. 2015). We need a paradigm shift that recenters humans in nature by looking to the past for solutions to our current problems, be it mule deer numbers, catastrophic megafires, or other natural resource issues that we are facing.

Recentring humans in this landscape, using Indigenous Knowledge combined with Western Science and working in partnership with Oregon’s Tribal Nations would do much to restore habitat for mule deer and other species.

Indigenous Knowledge is a body of observations, oral and written knowledge, innovations, practices, and ethical beliefs developed by Indigenous Peoples through interaction and lived experience with the environment over millennia. Indigenous Knowledge continually evolves, and includes understanding based on evidence acquired through direct contact with the environment passed from generation to generation (Eisenberg et al. 2024).

Two-Eyed Seeing combines the insights and deep wisdom of Indigenous Knowledge and the empirical strengths and logic of Western Science to gain binocular vision that enables people to develop broad-minded solutions to challenging ecological problems (Bartlett 2012 Reid et al. 2021).

I recommend active restoration of mule deer habitat using the Good Neighbor Authority and other federal and state laws, working with collaborative groups that support Tribal and rural community engagement in ecocultural restoration using Two-Eyed Seeing.

Literature Cited:

- Bartlett, C., Marshall, M. & Marshall, A. (2012). Two-eyed seeing and other lessons learned within a co-learning journey of bringing together Indigenous and mainstream knowledges and ways of knowing. *Journal of Environmental Studies and Sciences*, 2, 331–340.
- Bergman, E. J., P. F. Doherty, Jr., C. J. Bishop, L. L. Wolfe, and B. A. Banulis. 2014. Herbivore body condition response in altered environments: mule deer and habitat management. *Plos One* 9:e106374.
- Cain, J. W., J. H. Kay, S. G. Liley, and J. V. Gedir. 2024. Mule deer (*Odocoileus hemionus*) resource selection: trade-offs between forage and predation risk. *Frontiers in Ecology and Evolution*. doi: 10.3389/fevo.2024.1121439
- Eisenberg, C., Prichard, S., Hessburg, P., Nelson, M.P., Asselin, H., Beck, C., Berrill, J.-P., Brown, S.J., Chamberlain, C., Chesonis, T., Christianson, A.C., Cova, C., DeLuca, T.H., Desautel, C., Falk, D., Grant, E., Gray, R.W., Hankins, D., Hoagland, S., Kipfmüller, K., Kobziar, L., Long, J., Merschel, A., Monroe, A., Nelson, K., Parisien, M.-A., Pérez-Salicrup, D., Proulx, G., Quinn-Davidson, L., Russell, A., Scheller, R., Stambaugh, M., Steel, Z., Varner, M., Vredenburg, T., Whitman, E., and Zampieri, N. 2024. *Braiding Indigenous and Western Knowledge for Climate-Adapted Forests: An Ecocultural State of Science Report*. https://depts.washington.edu/flame/mature_forests/pdfs/BraidingSweetgrassReport.pdf
- Forrester, T.D. and Wittmer, H.U., 2013. A review of the population dynamics of mule deer and black-tailed deer *Odocoileus hemionus* in North America. *Mammal Review*, 43(4), 292-308.
- Hessburg, P. F., Miller, C.L., Parks, S.A., Povak, N. A., Taylor, A. H., Higuera, P. E., Prichard, S. J., North, M. P., Collins, B.M., Hurteau, M. D. and Larson, A. J., 2019. Climate, environment, and disturbance history govern resilience of western North American forests. *Frontiers in Ecology and Evolution* 7:239.
- Mahoney, S., Krausman, P., and Weir, J., 2015. Challenges for conservation and sustainable use in North America. *International Journal of Environmental Studies*. 72. 1-8. 10.1080/00207233.2015.1073475.
- Oregon Department of Fish & Wildlife (ODFW) 2024. *Oregon's Mule Deer Management Plan*.
- Reid, A.J., Eckert, L.E., Lane, J.F., Young, N., Hinch, S.G., Darimont, C.T., Cooke, S.J., Ban, N.C. and Marshall, A., 2021. "Two-Eyed Seeing": An Indigenous framework to transform fisheries research and management. *Fish and Fisheries*, 22(2), 243-261.