

PopEquus: modeling wild horse population growth on public lands

PopEquus is a modeling tool developed by US Geological Survey that helps predict the expected outcomes of different wild horse management actions, including removals and the use of short- and long-term fertility control methods. Users can compare horse population sizes, on-range costs, and off-range costs for different alternatives.

The USGS Fort Collins Science Center began developing *PopEquus*, with BLM financial support, in 2016. *PopEquus* became publicly available in January 2023. *PopEquus* can be accessed by anyone at <https://rconnect.usgs.gov/popequus/>.

How does PopEquus work?

PopEquus is a useful tool that can help BLM herd and land managers predict different outcomes of various population control methods. The model can project, for example, what the population size of a given wild horse herd will be after ten years using a fertility control vaccine to prevent pregnancy in a proportion of mares, as well as the expected cost. That information would be useful in developing and comparing various potential plans for herd management.

The BLM currently uses a model known as 'WinEquus', designed in 1996, which is required in environmental assessments to test whether any alternatives would cause a local herd size to go below appropriate management level. However, the 'WinEquus' model is hard to use and lacks important functions, and in need of replacement. *PopEquus* is not required for environmental assessments now, but it may be in the future.

PopEquus models one herd at a time and does not account for land health and ecological factors, local management constraints, or overall program costs or priorities. The model should not be considered a replacement for the BLM's decision-making process and the public comment opportunity and analysis required by the National Environmental Policy Act; rather, *PopEquus* is a tool that can help inform BLM about the potential outcomes of various management options in a given HMA or Complex.

What demographic rates does PopEquus use for its predictions?

PopEquus uses peer-reviewed sources for its assumptions about survival, fertility, and fertility control efficacy, and data from the BLM and other sources regarding the costs of the management actions included in the model. *PopEquus* is open-source and the rates and methods behind its assumptions are available to the public on the USGS website that hosts the tool.

To submit additional peer-reviewed data to be considered in a future version of *PopEquus*, contact USGS research wildlife biologist Kate Schoenecker at schoeneckerk@usgs.gov.