Who Let the Dogs Out?
Canine Distemper in California

Canine distemper virus (CDV) is a Morbillivirus in the family Paramyxoviridae that causes extreme sickness and can have lasting damage to infected individuals. This virus exists in many terrestrial canids and can also infect domestic dogs. Typical of morbilliviruses, it is highly virulent and can mutate quickly as demonstrated by new strains that have been identified in the northeastern United States.

While other important viruses such as rabies, have been heavily monitored, CDV has little surveillance at state and federal levels. Since new distemper viruses are increasingly being identified, this project aims to determine areas of high risk for spillover of the virus into humans. Use of spatial analysis will allow us to look at multiple risk factors, identify recommended areas for surveillance and determine vulnerable spaces for a potentially dangerous new outbreak.

Methodology

A raster calculator was run to determine areas that had the highest risk for CDV spillover. All factors were weighted evenly and combined. Each factor was ranked 1-5 and the total risk score was calculated to have a range of 8 to 21. The max possible score is 25. The counties with the highest score were those of Sacramento, Solano, Orange, Marin and Alameda. With new strains of canine distemper making its way across the country, these counties should take extra precaution to encourage routine vaccination in domestic dogs and increased surveillance for carrier populations. Notably, the black-footed-ferret who can also succumb to canine distemper, is listed as a federally endangered species. A large outbreak in their populations may further put populations at risk.

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Rabies on the Rise

Rabies cases across California have increased over the past five years. The number of cases for 2019 has only been documented until October 11th of this year, making the counts not reflective of a full year total. With an increase in rabies cases across the state and notably in animals that are also able to carry CDV it is important to determine what is causing the rise in cases and if there are environmental or anthropogenic factors that may be making animals more susceptible. Since both rabies and CDV can present similar clinical symptoms, taking care to confirm accuracy in diagnostic testing is important.

The Next Big Thing...

A raster calculator was used as a proxy to predict possible areas of high CDV in wildlife. Data were reclassified and areas at high risk for CDV were where there were more incidences of rabies cases.