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Working to protect and restore Western Watersheds and Wildlife

May 14, 2020

Carey Feierabend
Acting Superintendent
Point Reyes National Seashore
1 Bear Valley Road
Point Reyes Station, California 94956

Via email to carey_feierabend@nps.gov

Dear Acting Superintendent Feierabend,

We write to you to express our concern that livestock grazing on Point Reyes National Seashore may be a major risk factor for zoonotic disease transmission to Park visitors and staff, an issue that has not been adequately addressed in the Environmental Impact Statement ("EIS") for the General Management Plan ("GMP") set to govern leasing by private livestock operations of National Park Service lands on Point Reyes National Seashore and Golden Gate National Recreation Area (collectively, "the Parks") for the purpose of commercial livestock production. In particular, livestock on Point Reyes are known carriers of the bacterium that causes Johne's disease in cattle and elk, and is likely responsible for causing Crohn's disease and other ailments in humans. The significance of this issue did not become obvious until the recent COVID-19 pandemic, which reached crisis stage (and widespread public attention) only after the comment period for the Draft EIS for the GMP had closed. We therefore submit this letter and the attached science in advance of the Final EIS for the Park Service to consider in detail as it deliberates over whether or not to permit livestock production on Point Reyes National Seashore and Golden Gate National Recreation Area under the forthcoming GMP.

COVID-19 is a zoonotic disease (a disease transmitted from animals to humans), believed to have been transmitted from captive wildlife to humans at a "wet market" in or near Wuhan, China. Other prominent zoonotic diseases that have resulted in major epidemics and widespread deaths among humans include HIV, Ebola, and the Spanish flu. According to Keusch et al. (2009: 103), livestock can be a major source of zoonotic disease transmission, because "food-animals are only vaccinated against diseases as a matter of cost–benefit if there is a concern regarding the health of the herd or a high probability of human health risk" and because regular dosing of livestock with antibiotics can result in antibiotic-resistant strains of pathogens.

On Point Reyes National Seashore, livestock are known to be carriers of the bacterium *Mycobacterium avium paratuberculosis* (sometimes simply *M. paratuberculosis*, or abbreviated "MAP"), which is known to cause Johne's disease in ungulates. Reimann et al. (1979) documented that 5 of 10 cattle herds tested at Point Reyes had Johne's disease infection; more recently Cobb (2010) stated that "[t]here is currently no information on Johne's disease prevalence in Pt. Reyes cattle." Apparently there has been little (if any) recent testing of cattle for this disease. The livestock on Point Reyes have already transmitted Johne's disease pathogens to the National Seashore's wild herds of tule elk, with positive infections documented by Cook et al. (1997), Manning et al. (2003), and Cobb (2010). This remains the current state of knowledge regarding Johne's disease on Point Reyes according to the National Park Service itself, on its Johne's Disease FAQs webpage, last updated in 2016. Whereas the National Park Service has authorized "test and cull" programs to identify and kill tule elk infected with the pathogen, to our knowledge this has never been required for cattle on Point Reyes National Seashore or Golden Gate National Recreation Area, even though livestock are the primary source and reservoir of this disease-causing pathogen.

M. a. paratuberculosis is potentially a zoonotic disease, and has been implicated as a potential cause of Crohn's disease (*e.g.,* Abubakar et al. 2009, Waddell et al. 2016a, b, Timms et al. 2018), multiple sclerosis (Waddell et al. 2015), Irritable Bowel Disease (Pierce 2018), Type 1 diabetes (Dow and Sechi 2019), and colorectal cancer (Pierce 2018). Regardless of definitive links with the named diseases above, *M. a. paratuberculosis* definitively invades the cells of the human small intestine, causing inflammation and severe tissue damage according to Golan et al. (2009). This finding is supported anecdotally by Oken et al. (2017).

There is a particularly well-researched link between Johne's disease and Crohn's disease, via *M. a. paratuberculosis*. Timms et al. (2018) found a significant correlation between MAP infection and Crohn's disease. McNees and Graham (2018) found that *M. a. paratuberculosis* is seven times more likely to be found in Crohn's disease patients than in the general population. According to the Johne's Info Center (no date), while the link between the bacterium and the Crohn's remains scientifically controversial, there is a "preponderance of evidence" that Crohn's is caused by the bacterium. Polymeros et al. (2006), Feller et al. (2007), and Abubakar et al. (2008) each found a high incidence of *M. a. paratuberculosis* in patients with Crohn's disease, suggesting a causative link, but concluded that this link remains unproven. Waddell et al. (2016a) surveyed medical researchers, and stated, "Topic specialists believed that *M. paratuberculosis* is likely a risk to human health (44.8%) and, given the paucity of available evidence, most frequently ranked it as a moderate public health issue (40.1%). ... Topic specialists identified contact with ruminants and dairy products as the most likely routes of exposure for humans." Taking a slightly different tack, Davis (2018) argues that *M. a. paratuberculosis* does not cause Crohn's disease, but instead causes Johne's disease in humans, with essentially identical symptoms. Thus, it appears that there is a consensus among the medical research community that *M. a. paratuberculosis* causes serious diseases in humans, and the remaining controversy is over the precise classification of those diseases.

Livestock present a grave risk for transmission of this bacterium to humans. According to Hruska and Pavlik (2018),

> "Paratuberculosis in cattle and other ruminants is a source of enormous contamination of the environment but also of milk and meat by MAP.

> Muramyl dipeptide from mycobacteria, namely MAP, and Crohn's disease as a representative of diseases often called civilization threats, are important pieces of the gigantic puzzle. Mycobacteria in the environment and foodstuffs have to be acknowledged as a public health risk, which can never be completely eliminated."

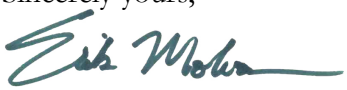
But cattle *can* be completely eliminated from the Parks, thereby eliminating public health threats to Park visitors. In Waddell et al. (2016b), "Evidence from 255 primary research papers is summarized; most examined the prevalence or concentration of M. paratuberculosis in animals (farmed domestic, pets and wildlife) (n=148 [studies]), food for human consumption (62 [studies]) (milk, dairy, meat, infant formula) or water (drinking and recreational) and the environment (farm, pasture and areas affected by runoff water)(20 [studies])." MAP can survive for 16 to 20 weeks in water, and for more than 90 weeks in sediment (*id.*). According to the Johne's Information Center at the University of Wisconsin Madison (no date), contaminated water from dairy operations is a potential source of human infection. In addition, dust from dairy barns can show high rates of MAP contamination, and MAP can also be tracked from dairy barns to surrounding areas on the footwear of workers (Eisenberg et al. 2012).

The known infection of livestock on Point Reyes National Seashore with *M. a. paratuberculosis* presents a public health risk via a number of contact pathways. Cattle, particularly in high concentrations, contaminate surface waters with which the public may come in direct contact. Kehoe Creek is particularly problematic in this regard, due to its history of high levels of fecal coliform contamination, and the fact that it drains directly to one of the National Seashore's most popular beaches. Western Watersheds Project has already alerted the Park Service to the public health risk posed by *E. coli* poisoning in this particular area, and we now put the agency on notice that *M. a. paratuberculosis* presents a risk that potentially is even greater. Second, the Park Service permits livestock operations to liquify untreated manure and spread it on the lands of Point Reyes National Seashore. The public may thereby unknowingly come into contact with bacterial contamination via this pathway. Finally, meat and dairy products potentially contaminated with *M. a. paratuberculosis* are sold throughout the surrounding region. Because the National Park Service knows about the infection of cattle on Point Reyes, yet does nothing to require the elimination of the disease, it is reasonable to expect that the Park Service is legally liable for any outbreak of diseases in humans that is traced back to infected cattle on the National Seashore and/or National Recreation Area. In our view, the Park Service has a responsibility to protect the human health and safety of the 3 million visitors who recreate on Point Reyes National Seashore each year, and should not assume the legal liabilities of putting the public at risk for zoonotic disease transmission to extend the questionable benefit of commercial beef and dairy operations within the Parks.

We bring this information to the Park Service's attention because the agency has an affirmative responsibility to protect public health and safety, and to eliminate any possibility of public health risks posed by authorizing continued presence of infected livestock in an area of highly concentrated recreational use. Please add this letter and the attached scientific studies to the administrative record for the Point Reyes, and consider these concerns (and

provide an analysis of their impacts to the human environment) as part of your General Management Plan process.

Sincerely yours,



Erik Molvar
Executive Director

Cc: Cicely Muldoon, Superintendent, Point Reyes National Seashore (cicely_muldoon@nps.gov)

Dave Press, Wildlife Biologist, Point Reyes National Seashore (dave_press@nps.gov)

Stan Austin, Regional Director, National Park Service (stan_austin@nps.gov)

List of Attachments:

Abubakar et al. 2008. Detection of *Mycobacterium avium* subspecies *paratuberculosis* from patients with Crohn's Disease using nucleic acid-based techniques: A systematic review and meta-analysis. Inflamm. Bowel Dis. 14: 401-410.

Cobb. 2010. Spatial ecology and population dynamics of tule elk (*Cervus elaphus nannodes*) at Point Reyes National Seashore, California. PhD Diss., Univ. Calif. Berkeley, 202 pp.

Cook et al. 1997. Radiometric culture of *Mycobacterium avium paratuberculosis* from the feces of elk. J. Wildl. Dis. 33: 635-637.

Davis. 2018. Why is the obvious not obvious, it's Johne's Disease (Paratuberculosis), not Crohn's Disease. EC Gastroenterol. Diget. Syst. 5: 752-758,

Dow and Sechi. 2019. Cows get Crohn's Disease and they're giving us diabetes. Microorganisms 7, 466; doi:10.3390/microorganisms7100466.

Eisenberg et al. 2012. Environmental contamination with *Mycobacterium avium* subspecies *paratuberculosis* within and around a dairy barn under experimental conditions. J. Dairy Sci. 95: 6477-6482.

Feller et al. 2007. *Mycobacterium avium* subspecies *paratuberculosis* and Crohn's disease: a systematic review and meta-analysis. Lancet Infect. Dis. 7: 607-613.

Golan et al. 2009. *Mycobacterium avium paratuberculosis* invades human small-intestinal goblet cells and elicits inflammation. J. Infect. Dis. 199: 350-354.

Hruska and Pavlik. 2018. Crohn's disease and related inflammatory diseases: From many single hypotheses to one "superhypothesis." Veterinarni Medicina 59: 583-630.

Johne's Disease FAQs. National Park Service, Point Reyes National Seashore, 2016.

Johne's Information Center. No date. Zoonotic potential. Content by Dr. Michael Collins and Dr. Elizabeth Manning. University of Wisconsin Madison School of Veterinary Medicine; online at https://johnes.org/zoonotic-potential/.

Keusch et al. 2009. Sustaining global surveillance and responses to emerging zoonotic diseases. Washington, DC: National Academies Press, 338 pp.

Manning et al. 2003. Testing for *Mycobacterium avium* subsp. *paratuberculosis* infection in asymptomatic free-ranging tule elk from an infected herd. J. Wildl. Dis. 39: 323-328.

McNees and Graham. 2018. *Mycobacterium avium* subspecies *paratuberculosis*: An infectious cause of Crohn's disease? Romanian Arch. Micriobiol. Immunol. 77: 173-174.

Oken et al. 2017. Is *Mycobacterium avium paratuberculosis* the trigger in the Crohn's Disease spectrum? Open Forum Infect. Dis. 4(3) https://doi.org/10.1093/ofid/ofx104.

Pierce. 2018. Could *Mycobacterium avium* subspecies *paratuberculosis* cause Crohn's disease, ulcerative colitis…and colorectal cancer? Infect. Agents Cancer 13:1 DOI 10.1186/s13027-017-0172-3.

Timms et al. 2018. The Association of *Mycobacterium avium* subsp. *paratuberculosis* with Inflammatory Bowel Disease. PLOSone 11(2): e0148731. doi:10.1371/journal.pone.0148731.

Waddell et al. 2015. The zoonotic potential of *Mycobacterium avium* ssp. *paratuberculosis:* A systematic review and meta-analyses of the evidence. Epidem. Infect. 143: 3135-3157.

Waddell et al. 2016a. The potential public health impact of *Mycobacterium avium* ssp. *paratuberculosis:* Global opinion survey of topic specialists. Zoonoses Publ. Health 63: 212-222.

Waddell et al. 2016b. *Mycobacterium avium ssp. paratuberculosis* detection in animals, food, water and other sources or vehicles of human exposure: A scoping review of the existing evidence. Prevent. Vet. Med. 132: 32-48.