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IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MONTANA
MISSOULA DIVISION

<p>WESTERN WATERSHEDS PROJECT, et al.,</p> <p>Plaintiffs,</p> <p>v.</p> <p>SALAZAR, et al.,</p> <p>Defendants.</p>	<p>CV-09-159-M-CCL</p> <p>DECLARATION OF ROBERT LINDSTROM</p>
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DECLARATION OF ROBERT LINDSTROM

Pursuant to 28 U. S. C. § 1746, I, Robert Lindstrom, hereby declare under penalty of perjury that the following is true and correct:

1. I received a BA in Biology from the University of California, San Diego, with an emphasis in molecular biology. One of my classmates, Dr. David Gelfand, was an inventor of the *Thermus aquaticus* Polymerase Chain Reaction (“PCR”), a DNA-fingerprinting technique.
2. My professional experience includes 20 years as an employee of the National Park Service in Yellowstone National Park (“YNP”). I began my career as an emergency firefighter during the catastrophic wildfires of 1988, worked seasonally in trail maintenance in 1989, and then as a fee collection ranger at the YNP West Gate through 1990. In 1991, I became a physical science technician for the YNP soil survey and later served as an administrative technician for Yellowstone Center for Resources (“YCR”) in 1992.
3. From 1993 to 1998, I served as research permit coordinator for YCR. During this time I helped to develop a microbiology/biotechnology program concerning the commercial use of research specimens. This program was initiated by the PCR process based on the YNP hot spring microbe *Thermus aquaticus*. My work was published in peer-reviewed literature during this period.
4. In the mid-1990s, no reliable field test existed for *Brucella abortus* (“*Bab.*”), the bacteria that causes the disease brucellosis in North American bison (*Bison bison*) and other ungulates. At the time, NPS believed 20% of the YNP bison herd were infected with *Bab.* These observations were based on two tests, a culture test that was not completely accurate and relied on hard tissue samples, and an immunological test, which tested for *Bab* antigens and could produce false positives even when *Bab.* was not alive or present in the tested animal. The culture test is problematic because it can produce false negatives if the tester fails to successfully encourage *Bab.* growth in the sample. The NPS began the mass slaughter of bison near YNP borders in 1996 and 1997, and cited brucellosis transmission to cattle as their primary rationale for this management technique.


5. Concerned that the other 80% of the herd were being slaughtered even though they were disease-free, I became interested in developing a reliable test for *Bab*. In 1996, I received a grant award from the National Science Foundation to attend a PCR training program for teachers at San Francisco State University. I utilized this training by developing a three-year project to test PCR protocol using oligonucleotide primers to identify various strains of *Bab*.
6. From 1996 to 1998, I was the Principal Investigator for YNP Research Permit #2000R, entitled "Molecular Analysis of *Brucella abortus* in Wild Bison." Throughout this project I collaborated with biologists and members of the biotechnology industry to develop a field test using real-time PCR technology to identify bison infected with brucellosis using the blood samples of 500 individual slaughtered animals. My co-investigators on this project included Dr. Francisco Roberto, chair of biotechnology at the Idaho National Environmental Engineering Laboratory ("INEEL"). I authored an article for the "Current News" section of American Society of Microbiology News concerning the project and Dr. Roberto also published a paper on real-time PCR in the journal of Applied Environmental Microbiology.
7. Research Permit #2000R was headquartered in a small PCR lab based in the Mammoth Research Lab trailer with donated equipment from INEEL. Hundreds of blood samples collected from slaughtered animals were catalogued by biologists and tested. Preliminary results of the PCR study published in the 1996 and 1997 NPS Investigator Annual Reports showed that fewer than 3 of the 500 slaughtered bison actually tested positive for brucellosis, far below the 20% infection rate assumed by the NPS.
8. All NPS research permits are renewed on an annual basis. In 1998, my supervisor, Deputy Director of the YCR, Wayne Brewster ordered me not to renew the permit, even though this was an independent project where I worked on my own time. Mr. Brewster provided no explanation or reason for seeking to discontinue the project.
9. After resubmitting the renewal application, I was immediately reassigned to other duties in the YNP Division of Administration, after which I filed an official complaint and grievance for unlawful termination of an official research permit. The NPS took the official position that the renewal application had been lost and did not actually exist. Brewster confiscated all frozen DNA samples and the lab equipment from the Mammoth research facility, although Dr. Roberto

carried on the PCR detection project from INEEL under a new permit number.

10. Based on the best available science as confirmed by my own professional experience, observations, and research, the PCR assay is the most accurate test known for brucellosis in ungulate mammals. When blood is the tissue sampled, the test is nonlethal to the examined animal. To the best of my knowledge, the only problems with the test or its reliability would occur if samples were mistreated or contaminated.
11. While an employee of YNP and NPS, I witnessed the NPS mandated slaughter of 7,000 North American bison, most of which in my opinion and according to modern DNA evidence were disease-free. As a team member of YCR and a manager of the YNP research permitting system, I am aware of no scientific evidence on the record supporting the mass slaughter of bison outside YNP that could not be handled by other means such as vaccination, fencing, habitat acquisition, or ethical hunting.
12. Before the Interagency Bison Management Plan (“IBMP”) was implemented, I wrote a letter to the YNP Superintendant proposing a “Biological Buffer Zone” around YNP to separate wild bison from livestock and recommending ethical hunting as the preferred management tool in the event that the bison population became unsustainable. This reasonable alternative to the IBMP was not considered.
13. In my opinion, the IBMP is not justified by the biological threat bison pose to cattle and this opinion is consistent with the findings of Kilpatrick, 2009. Brucellosis can only be spread between mammalian species through liquid-to-liquid contact of colony forming units. The spread of *Bab.* from bison to livestock is extremely unlikely because the two species have different estrus cycles, meaning that bison and cattle would intermingle at the critical time only during rare and predictable climatic conditions and interactions could be easily prevented.
14. In my opinion, nearly all bison slaughtered by NPS are disease-free and pose no threat to the meager livestock holdings in the Greater Yellowstone Ecosystem, except for the expensive breeding cattle in the Yellowstone River valley outside YNP, which could be protected by vaccination, fencing, habitat acquisition, or ethical hunting.
15. In my opinion, the risk of brucellosis transmission to humans from infected cattle is almost zero, in part because the primary mechanism

for transmission was eliminated when pasteurization of milk was instituted, and in part because any infected cattle must be destroyed. This opinion is consistent with the findings of the Centers for Disease Control and Prevention at the Department of Health and Human Services. The incidence of undulant fever in America is thus exceedingly low, about 100 cases/yr., and those cases are from states that do not have a problem with brucellosis-infected cattle. The chance of a human contracting brucellosis from a bison is even less than that of transmission from cattle, as there are virtually no opportunities for liquid-to-liquid contact.

Dated this 1st day of JULY, 2010.



Robert Lindstrom
National Park Service, Retired