

WHAT IS IT? WHO GET IT? AND HOW IT SPREADS?

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# LEPTOSPIRA BACTERIA IN NATURAL AREAS

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“ALLERTON  
PARK NATURE  
AREA IS A  
NATIONAL  
NATURAL  
LANDMARK IN  
ILLINOIS”

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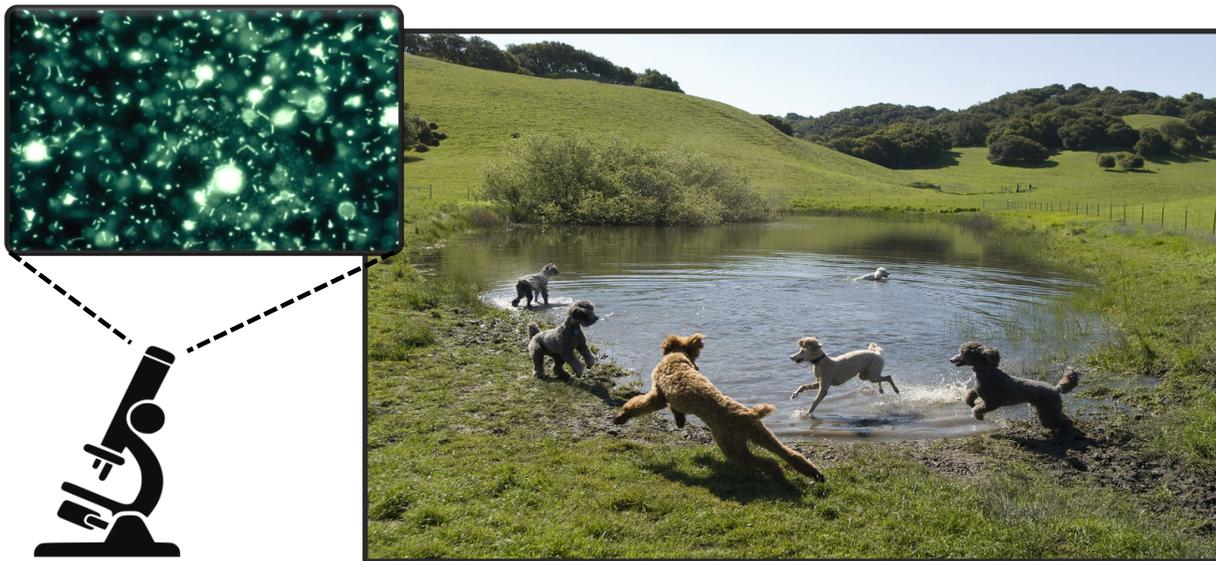
*Photograph by VSmithUK*

**Y**ou need to know that Leptospirosis is a disease caused by the bacteria *Leptospira*. The *Leptospira* bacteria are spread through infected animals' urine, which can get into water or soil and survive there for weeks to months.<sup>1</sup> The number of new cases of Leptospirosis has increased in humans and canines across North America. You also need to know that Leptospirosis in humans may cause mild flu-like symptoms, such as chills and headaches. However, when the bacteria affect organs, such as the liver, lungs, heart, and kidneys, it causes a more severe reaction that can lead to organ failure.<sup>2</sup> The most severe Leptospirosis is commonly known as Weil's disease in humans.<sup>3</sup> Animals may suffer from a subclinical infection with mild

symptoms to a more advanced condition involving multiple-organ failure and subsequent death.

Leptospirosis's clinical signs and symptoms will depend on the animal species infected and the type of *Leptospira* serovar affecting them (a serovar is a variation in the *Leptospira* bacteria, also known as bacterial strain). Muscle pain, pancreatitis, uveitis (eye inflammation), dysuria (pain while urinating), hemolytic anemia, or respiratory disease are some of the clinical problems developed by animals.

Leptospirosis in pregnant animals may result in abortion, stillbirths, weak newborns, or the birth of healthy but infected offspring.<sup>4</sup> It is also important to know that Leptospirosis is an occupational hazard for sewer workers, miners, butchers, and people handling animals, such as veterinarians, farmers, and fishermen. You and your pet can contract the disease while drinking water contaminated with the *Leptospira* bacteria during your visit to natural and recreational areas. Also, by contact as the bacteria can penetrate thin or wounded skin.<sup>5</sup>



**Animals can get infected by ingesting contaminated water or via the skin, as *Leptospira* bacteria can penetrate thin or damaged skin.**

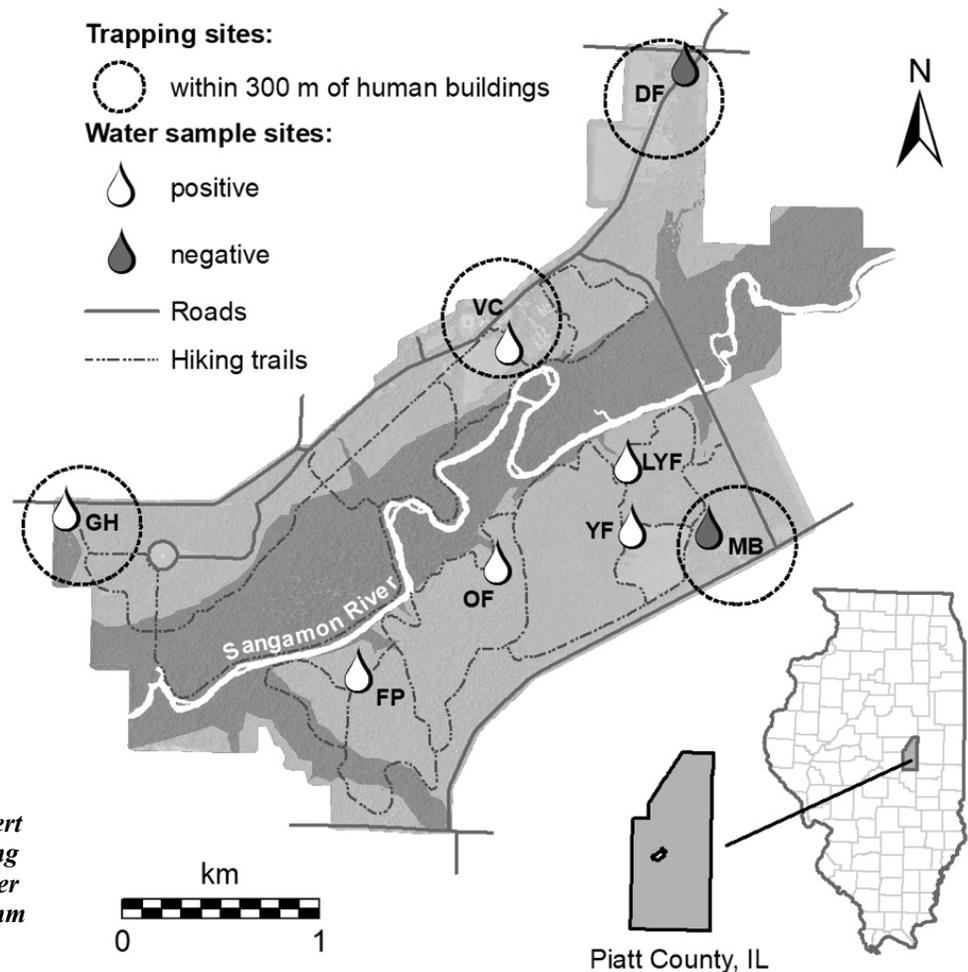
## What about *Leptospira* in the environment?

Several studies report *Leptospira*'s seroprevalence (antibody titers against a specific *Leptospira* variant in the blood) in mammals and reptiles. There have been findings of leptospiral DNA (evidence of the bacteria) in natural water sources. However, there has been little work to identify the *Leptospira* serovars in a singular natural habitat in Illinois.<sup>5</sup> The paper titled *Evidence of Leptospira Serovars in Wildlife and Leptospiral DNA in Water Sources in a Natural Area in East-Central Illinois, USA* (Grimm et al., 2020) serves as comprehensive work to learn more about the diversity of the bacterial in one single natural area. While this work was on a single natural area, the findings most likely extrapolate to other natural areas where similar wildlife and domestic dogs can be found. People who take dogs to a natural area or enjoy outdoor activities, like swimming and fishing in natural waterways, should know about *Leptospira* and other naturally occurring bacteria present in these environments.

In this paper, the authors evaluated the seroprevalence of *Leptospira* in animals and the presence of the bacteria in the environment in relation to sites, sampling protocols, and across time. Grimm et al. (2020) collected blood from sedated raccoons, opossums, and feral cats. All animals made a full recovery after being sampled and before being released where they were captured. Grimm et al. (2020) also collected water samples for analysis. The goal was to evaluate if any of the seven *Leptospira* serovars circulated in the sampled areas.

*“I did notice that the water sources sampled in this study were all within six meters of a marked trail, which would suggest easy access of these water sources for domestic dogs that frequent the area.”*

I did notice that the water sources sampled were all within six meters of a marked trail, which suggests easy access to these water sources for domestic dogs that frequent the area. As it turns out, *Leptospira* DNA (a signal of the bacteria) was detected in the water samples collected. There was also evidence that wildlife had been infected with multiple serovars. The Grimm et al. (2020) study was a capture-mark-recapture effort that evaluated if animals in this natural area were exposed to the bacteria over two years. Unfortunately, they could only collect blood samples, not urine samples, and therefore, this work did not test if wildlife were shedding the bacteria (releasing the bacteria in the urine).



*Figure 1. Map of Robert Allerton Park including trapping sites and water sample locations (Grimm et al 2020)*

Of increased interest is that *Leptospira* can thrive in natural areas building the opportunity for interspecies interaction and facilitating Leptospiral transmission. As pet owners, it is best to keep our dogs on a leash when visiting natural areas and bring clean water for ourselves and our dogs. For those pet owners who love hiking and traveling with their dogs, vaccination against Leptospirosis will help protect our beloved companions.

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## How to reduce your risk?<sup>2,5</sup>

Before exposure: Cover your wounds and wear protective clothing  
After potential exposure: wash or shower

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*Leptospira* bacteria can penetrate thin or damaged skin. Avoid swimming in ponds and lakes, they can have the bacteria.

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Don't let your dog eat anything that could be contaminated with other animal's urine, such as garbage, stagnant water, or soil.

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There is a vaccine for leptospirosis; Your veterinarian can advise whether or not a vaccine is appropriate for your dog.

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Always bring water for you and your pet

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Do not touch sick or dead animals.

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*“It will help protect you and your companion animal against the bacteria while visiting natural areas to be well informed and prepared. Preventive behavior is the key to dealing with leptospirosis.”*

### Why are these findings significant?

The answer is simple: we are all connected, and we share ecosystems with other creatures. As Leptospirosis cases increase in both humans and canines, it is best to understand *Leptospira*'s prevalence and ecology in the natural environment that we usually visit. Scientific research and knowledge help us mitigate transmission and

disease spread, understand risks to our health and domestic pets' health, and take necessary precautions.

### ***References:***

<sup>1</sup> CDC - Leptospirosis, Risk of Exposure.  
<https://www.cdc.gov/leptospirosis/exposure/index.html#:~:text=Leptospirosis%20occur%20worldwide%2C%20but%20is,Farmers>

<sup>2</sup> Grimm, K., Rivera, N.A., Fredebaugh-Siller, S., Weng, H.Y., Warner, R.E., Maddox, C.W. and Mateus-Pinilla, N.E., 2020. Evidence of leptospira serovars in wildlife and leptospiral dna in water sources in a natural area in east-central illinois, usa. *The Journal of Wildlife Diseases*, 56(2), pp.316-327.

<sup>3</sup> Leptospirosis (Weil's disease). New York state, Department of Health.  
[https://www.health.ny.gov/diseases/communicable/leptospirosis/fact\\_sheet.htm](https://www.health.ny.gov/diseases/communicable/leptospirosis/fact_sheet.htm)

<sup>4</sup> Merck Veterinary Manual. Overview of leptospirosis.  
<https://www.merckvetmanual.com/generalized-conditions/leptospirosis/overview-of-leptospirosis>

<sup>5</sup> World Health Organization. Preventing Leptospirosis.  
<https://i2.wp.com/raodoctor.com/wp-content/uploads/2018/12/prevention-of-leptospirosis.jpg?ssl=1>

#### *Picture 1.*

Allerton Park Nature Area is a national natural landmark in Illinois. Author: VSmithUK.

<https://www.flickr.com/photos/vsmithuk/370807991/sizes/o/in/photostream/>

#### *Picture 2*

Dogs playing at the pond. Photograph by Karen.

<https://www.flickr.com/photos/thepack/2519137519/>

*Leptospira bacteria in microagglutination test. Dark field microscopy. Copyright: Mrs. M Gatton, USDCDP.*

*A microscope icon. Author: Ben at Openclipart.*

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