

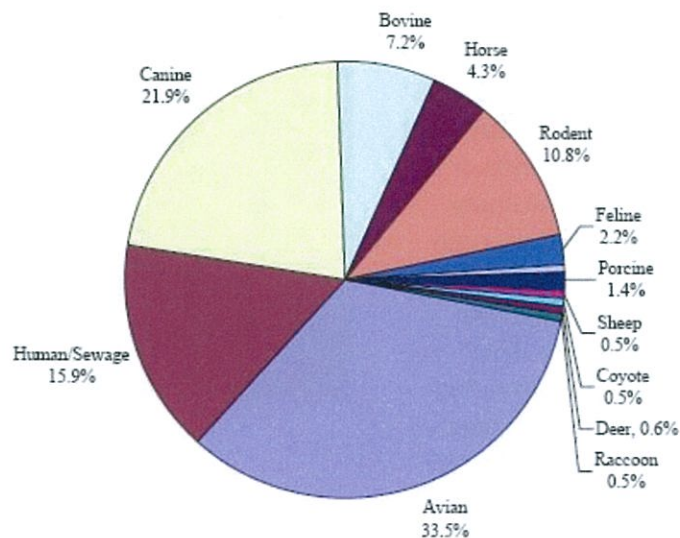
The Scoop on Dog Poop

When spring calls we love to get out and enjoy the great outdoors. We rush to our parks and open spaces, where we can run, hike, play Frisbee or picnic. It's all so perfect, until you take a deep breath and get a whiff of dog poop. Looking down at your new sneakers, you see that you've stepped in it, doggie doo. And you aren't alone. It's everywhere in Albuquerque. And it isn't doing us any good.

Unlike poop from herbivores like cows, rabbits or horses, dog poop does not make a good fertilizer for plants. It carries harmful bacteria and parasitic worms like roundworm. Cat poop is even worse, as it carries toxoplasmosis, a disease that is particularly hazardous for pregnant women, since it can seriously harm the central nervous system of an unborn child, resulting in fetal blindness, brain damage or other problems.

You might think that once the dog poop has dried out, the bacteria or parasitic worms are no longer a danger, but you'd be wrong. Bacteria can survive for years in dried out poop. Roundworm eggs can survive for months or even years. Eventually rains will wash over the poop carrying the disease agents down into the storm drains, those grates in the gutters near the sidewalk. From there, pipes carry the runoff directly to the river. There is no treatment plant for Albuquerque's storm water. It just dumps into the Rio Grande, carrying the bacteria and parasites with it. A surprising amount makes it to the river.

One study done by the Rio Grande Stormwater Quality Team analyzed DNA from the *E. coli* bacteria in the river. We know that all animals have *E. coli* bacteria living in their intestines to help digest food. We also know the *E. coli* end up in the poop. By identifying the bacteria DNA, they were able to identify what kind of animal pooped it.



Many of these results make sense. Birds are in first place. Ducks and geese float on the river in large groups and poop in the water. Human sewage, in third place, is most likely seeping into the river from homes with leaking septic systems. Septic systems are privately owned underground tanks where sewage is collected from a home. The tank is VERY expensive to fix, so individual homeowners often put off repairs.

More shocking is that *E. coli* from dog poop is in second place. Dogs don't float in large groups on the river. Dogs don't have leaking septic tanks. Where is it coming from?

Of course we know the answer. The fault lies with us. We often don't appreciate how small things we do can have a large impact on the environment. The problem arises when many people are contributing to the problem, even in such a small way.

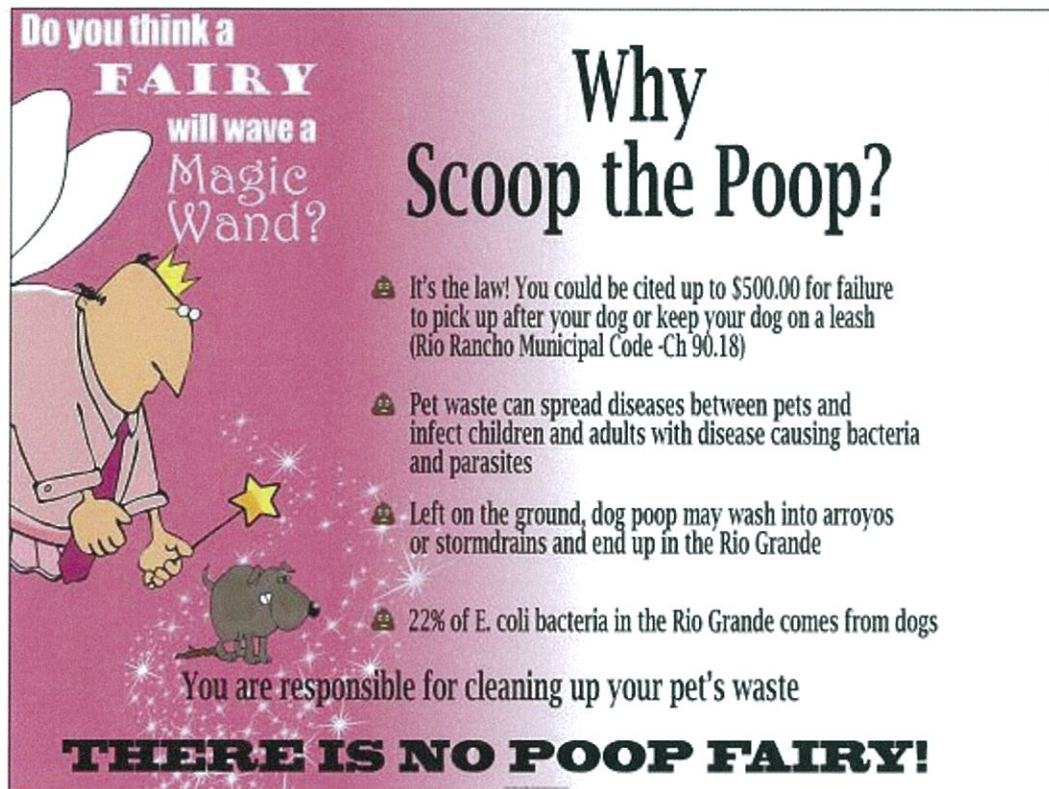
Environmentalists have coined the term, "tragedy of the commons," to describe how this can happen. The term was introduced by economist William Forster Lloyd in 1833. He wrote about "the commons," the shared lands where villagers could graze their cows and sheep. Lloyd illustrated how a single shepherd would receive great benefit for his family by adding one more sheep to graze on the commons. Indeed, how much damage can one sheep do? The cost of that sheep grazing on the commons is passed on to all the villagers equally and is small – until everyone adds one more sheep.

In 1968, ecologist Garrett Hardin published an article in *Science* magazine <http://science.sciencemag.org/content/162/3859/1243.full> in which he described the commons as our air, rivers, oceans, and natural resources. He stated that the tragedy of the commons is not just that we take things out of the commons according to our own self-interest, but that we put things in according to our own self-interest too -- things like pollution.

How can dog poop on the ground be a tragedy of the commons? It's all in the numbers. Albuquerque has about 80,000 registered dogs (plus more that are not registered). If each dog drops about ¼ pound of poop each day, that is approximately 20,000 pounds or 10 tons of dog poop per day. Multiply that by 365 days a year, and you can see the immensity of the problem. Luckily, most owners pick up their dog's poop. But many don't. This picture was taken at the trailhead in one of Albuquerque's open spaces. The pink flags indicate a pile of dog poop that was left behind. Shocking!



We all know what to do to fix this problem. We need to stop believing that the Poop Fairy will come and clean up our dog's mess. Because dog poop is non-point source pollution, we don't know whose dog's poop is in the river. It comes from all over Albuquerque. All of us need to do the right thing and scoop the poop!



Do you think a
FAIRY
will wave a
Magic
Wand?

Why Scoop the Poop?

- 🗑️ It's the law! You could be cited up to \$500.00 for failure to pick up after your dog or keep your dog on a leash (Rio Rancho Municipal Code -Ch 90.18)
- 🗑️ Pet waste can spread diseases between pets and infect children and adults with disease causing bacteria and parasites
- 🗑️ Left on the ground, dog poop may wash into arroyos or stormdrains and end up in the Rio Grande
- 🗑️ 22% of E. coli bacteria in the Rio Grande comes from dogs

You are responsible for cleaning up your pet's waste

THERE IS NO POOP FAIRY!

Want to learn more?

Sing along with Martin Luther's video Dog Doogity
<http://www.youtube.com/watch?v=jDh12w-jcfs#t=139>

Visit *Mother Earth News* to learn more about disease in dog poop and how to compost it to kill the biological agents.

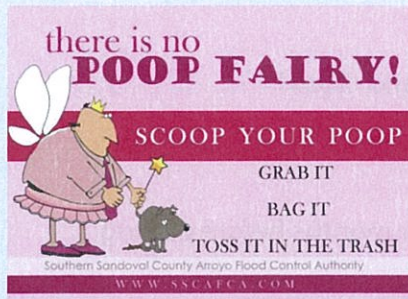
<http://www.motherearthnews.com/organic-gardening/composting-dog-poop-zmaz84sozraw.aspx>

VOCABULARY

1. Bacteria
2. Parasitic
3. Fetal
4. DNA
5. Sewage
6. Trailhead
7. Non-point source pollution

QUESTIONS

1. Why doesn't dog poop make good fertilizer for parks and crops?
2. Is it a good idea to leave dog poop in your backyard for months before picking it up? Why or why not?
3. What would be a good estimate of weight of dog poop dropped by Albuquerque's registered dogs in one year? Explain how you got your answer.
4. Based upon your personal experience with family and friends, how many unregistered dogs might live in Albuquerque. Explain how you came up with this estimate.
5. What are two main points being made by this text? Does the author provide evidence to support the claims? Cite evidence used.
6. How could you engineer a solution for monitoring and minimizing the dog poop in our Rio Grande?
7. Compare and contrast the information you took away from the article versus the song by Martin Luther. Which was more motivating for you to change behavior?



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Summary: Article presents evidence that dog poop, a non-point source of pollution, carries disease and relates that to the concept of the tragedy of the commons.

Grade: Seven

Subject Areas: Reading Informational Science Text

Common Core Standards and Benchmarks

READING INFORMATIONAL TEXTS

Key Ideas and Details

[CCSS.ELA-Literacy.RI.7.2](#)

Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.

Integration of Knowledge and Ideas

[CCSS.ELA-Literacy.RI.7.7](#)

Compare and contrast a text to an audio, video, or multimedia version of the text, analyzing each medium's portrayal of the subject (e.g., how the delivery of a speech affects the impact of the words).

[CCSS.ELA-Literacy.RI.7.8](#)

Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.

NextGen Science Standards and Benchmarks

ESS3.C: Human Impacts on Earth Systems

- Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)
- Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS3-3),(MS-ESS3-4)

NM Science Standards and Benchmarks

III.I.1 Explain how scientific discoveries and inventions have changed individuals and societies.

7 1. Analyze the contributions of science to health as they relate to personal decisions ... [Caring for the environment]

2. Analyze how technologies have been responsible for advances in medicine (e.g., vaccines, antibiotics, microscopes, DNA technologies). [We have learned what is in dog poop, how much is in the river, and how to treat diseases caused by those biological agents.]