Are we going to the dogs? The pet waste problem.

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Stepping In a Pile of Trouble

- Clallam County has an estimated 16,750 dogs.
- They produce about 3 tons of waste every day (over 2.19 million pounds a year).
- Dog waste has a variety of well-studied impacts on human health and water quality.
- Impacts are due to the presence of parasites and bacteria. High bacterial concentrations are possible, for example 0.03 oz. of dog feces can have 2 to 200 million colony-forming units of E. coli present. (Garfield, 2008)
- Researchers have also identified lesser known impacts that may present future challenges.
- Dog waste risks can easily be mitigated by scooping, bagging, and putting in the trash.

Dog Waste - By the Numbers

County	# of dogs	Tons/day	Tons/year
Clallam	16,750	3	1,009
Island	18,561	3	1,118
Jefferson	6,994	1	421
King	482,916	80	29,084
Kitsap	59,481	10	3,582
Mason	13,971	2	841
Pierce	193,464	32	11,651
San Juan	3,670	1	221
Skagit	27,781	5	1,673
Snohomish	176,912	29	10,654
Thurston	61,819	10	3,723
Whatcom	48,697	8	2,933

All Puget Sound counties - over 1 million dogs
183 tons of waste/day - 66,911 tons of waste/year

- Based on an average 0.33 pounds of daily produced waste
- Population estimates - U.S. Census Bureau. (July, 2016). Retrieved 3/15/18 from: www.census.gov/quickfacts/
- Dog ownership estimates – American Veterinary Medical Association. Retrieved 3/15/18 from: www.avma.org/KB/Resources/Statistics/Pages/Market-research-statistics-US-pet-ownership.aspx

Human Health Risks

- Most human illnesses from pet waste are caused by tiny amounts of fecal matter that enters the body through the mouth. This can happen through improper hand washing, children putting their hands in their mouths, or ingesting waste-contaminated water or shellfish.
- A dog doesn't necessarily need to look or act sick to carry harmful bacteria or parasites.
- *Salmonella* bacteria or Giardia parasite cysts found in fresh pet waste can be immediately infectious to people. While not all strains of Giardia are infectious to humans, the protozoa are widespread in dogs. Studies have shown that more than 20% of dogs may be infected with the pathogen. (Schueller, 2000)
- Old, dried-out stools can also cause disease and are *more likely* to contain infectious parasite eggs, such as those from hookworms or roundworms. These eggs are not infectious until they age in the stool over days or weeks. (Beeler, 2011)
- Parasite eggs can remain viable for years, resulting in long-term soil contamination if feces are allowed to disintegrate into the ground. Roundworms are readily detectable and treatable via deworming. (Beeler, 2011).

Recommended Actions

If disposed of properly, dog waste poses little threat to human health or water quality. A three-step process is the best way to reduce risk.

- **Scoop It** – Immediately scooping is the best practice to avoid soil contamination and parasitic infections.
- **Bag It** – Biodegradable bags are not required if waste is going to the landfill.
- **Put It in the Trash** – Composting is not recommended because of the difficulty in killing harmful organisms in home compost. Never flush waste or bags if you are on septic. Flush waste, but not bags, if you are on sewer.

Emerging Issues

- **Contaminated beach sediment** – Sands and sediments provide habitat for fecal bacterial populations in coastal zones. Fecal indicator bacteria are common in beach sands, both dry and submerged, as well as the water that comes in contact with it. While monitoring water is common, monitoring beach sediment is not. (Halliday, Gast, 2011)
- **Resistant bacteria** – There is increased evidence that pets and their feces may harbor antibiotic-resistant bacteria, posing new threats to public health. (Cinquepalmi et al., 2013)
- **Air pollution** – Bacteria from dog feces was present in US urban area, outdoor air samples taken during the winter. In winter months, bacteria from dog feces appears to be more prevalent than other types of bacteria. More study is underway. (Bowers, et al., 2011)
- **Norovirus** – Dogs may be capable of becoming infected with human norovirus. According to the researchers, "the finding raises the possibility of human-to-dog transmission of the virus, and may add norovirus to the list of known zoonotic illnesses, or diseases transmitted from animals to humans." (Caddy, et al., 2015)

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Water Quality Risks

When it rains, stormwater runoff transports pet waste pathogens, bacteria, and nutrients from upland areas to nearby streams, rivers, lakes, and coastal waters through storm drains, culverts and roadside ditches. Fecal matter contains nutrients such as nitrogen and phosphorus which act as fertilizer for algae and other aquatic plants. Overgrowth depletes oxygen, impacting fish and other aquatic life. Bacteria and other pathogens can contaminate shellfish, which feed by filtering the water, thus harming humans who eat shellfish harvested from the area.

The closer dog waste is deposited to water (or a transport conduit), the higher the chances the water quality will be compromised. The amount of vegetation or other barriers between the dog deposit and the water, the size and frequency of rainfall events large enough to transport waste particles, the amount of living E. coli in the dog feces, the soil type, and the evaporation rate also play a role in contamination. Cool, moist conditions (rainy season or snowmelt) are the most conducive for vectoring harmful microorganisms to the water. (Hanson, 2012)

Engaging the Public

Goal*: *Pet waste pick-up becomes an accepted social norm for dog owners

Education can be effective. In one study, prior to intervention only 32% of dog walkers picked up after their pets. After informational signs were posted, 60% picked up waste. When waste receptacles were added to the signs, the pickup rate increased from 60% to 84%. (May, n.d.)

Consistent messaging works. Messages like "scoop it, bag it, and put it in the trash" encourage those ready and willing to accept the desired behavior. Messaging is most effective with people who are unaware of or don't know the recommended practices. Family and pet health are key motivators. Barriers to picking up waste include: bad weather, darkness, physical disabilities, and sanitary concerns.

Don't expect 100% compliance. Some dog owners will not pick up pet waste. A study in Colorado found that while most visitors were aware of "leave no trace" concepts, 60% of the dog owners did not pick up dog waste (resulting in 30 tons of left behind deposits). However, when a "pick up after another dog owner" campaign was instituted, there was a 2/3 decrease in the amount of waste left. (Jones, Lowery 2004)

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