



Case Study: Stormwater Outreach

Dave Ward

Snohomish County Public Works

Surface Water Management



Fun with Pet Waste

Dave Ward

**Snohomish County
Public Works**

Surface Water Management

Pet Waste Management Research and Tools

Snohomish County Surface Water Management

Washington State Department of Ecology

Yikes!

Everett receives about 36 inches rain per year

Each acre receives about 1 million gallons of rain

Monroe receives about 53 inches of rain per year

Each acre receives about 1.5 million gallons of rain

Index receives about 110 inches rain per year

Each acre receives about 3 million gallons of rain









Fecal coliform bacteria machine



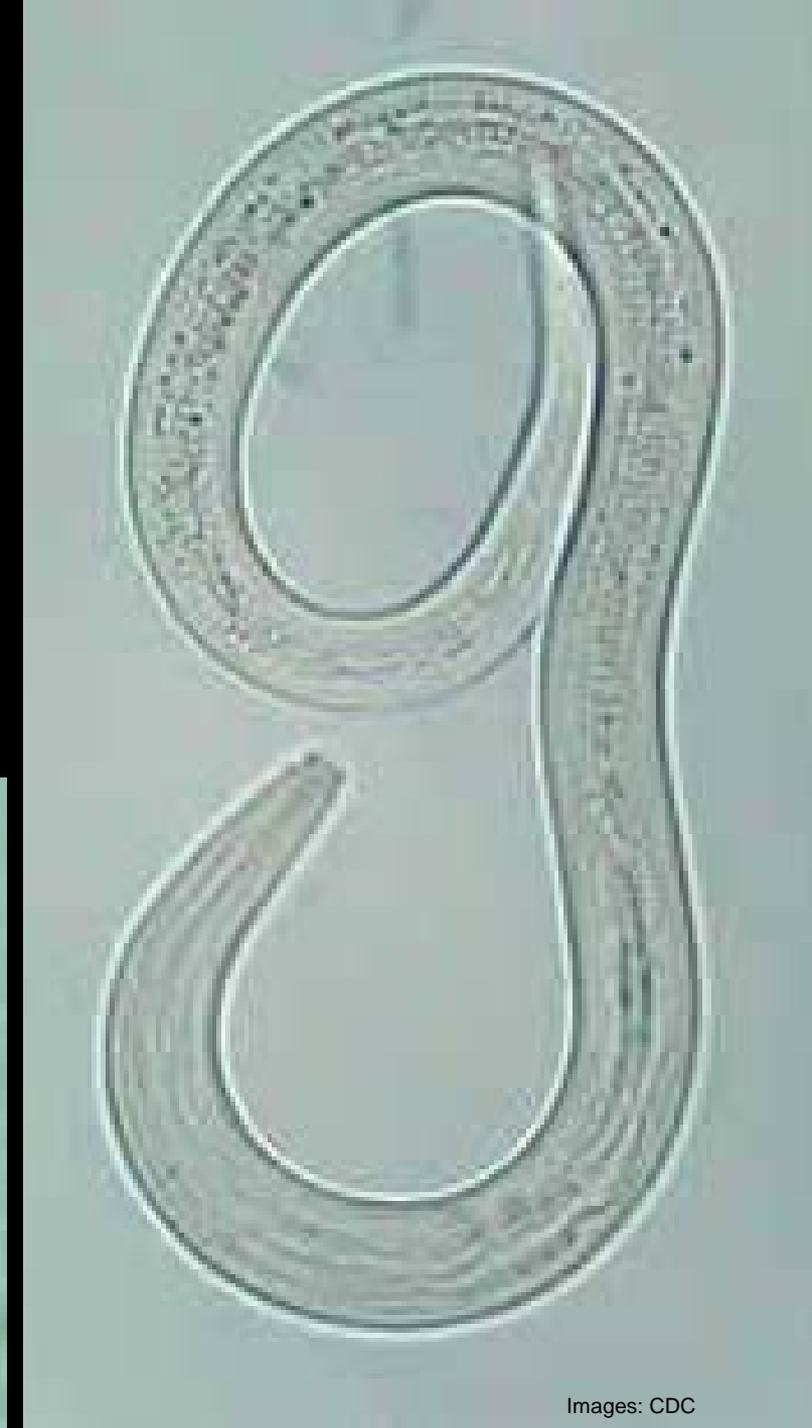
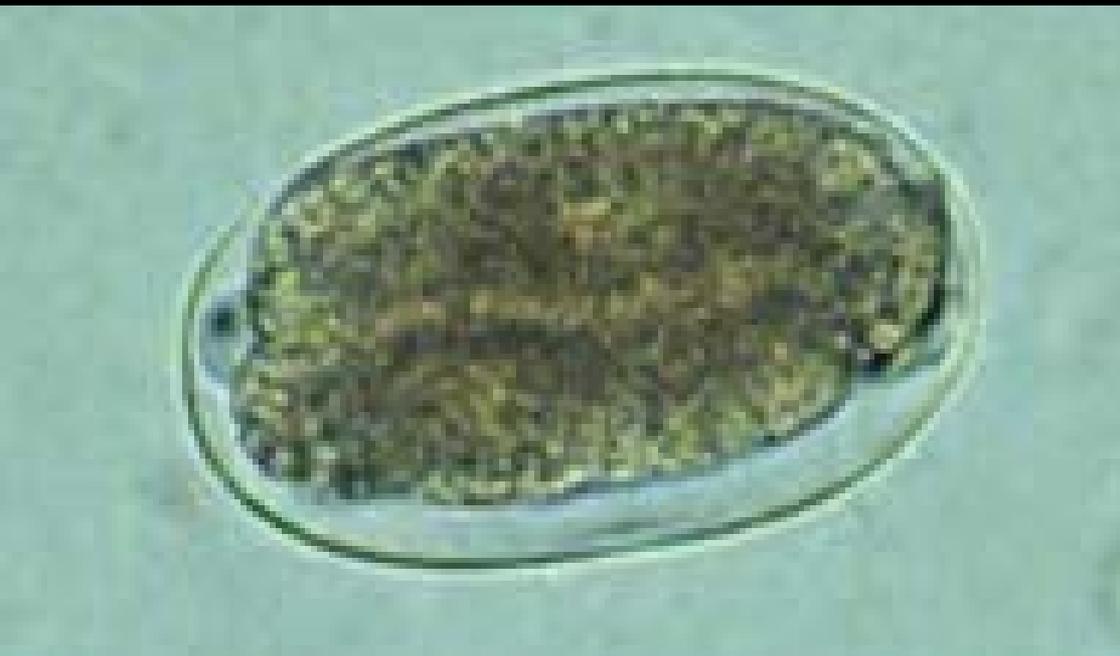


Photo: Dave Ward, Snohomish County

Ancylostoma sp. egg and larva

Can survive outside host 3-4 weeks in larval stage.

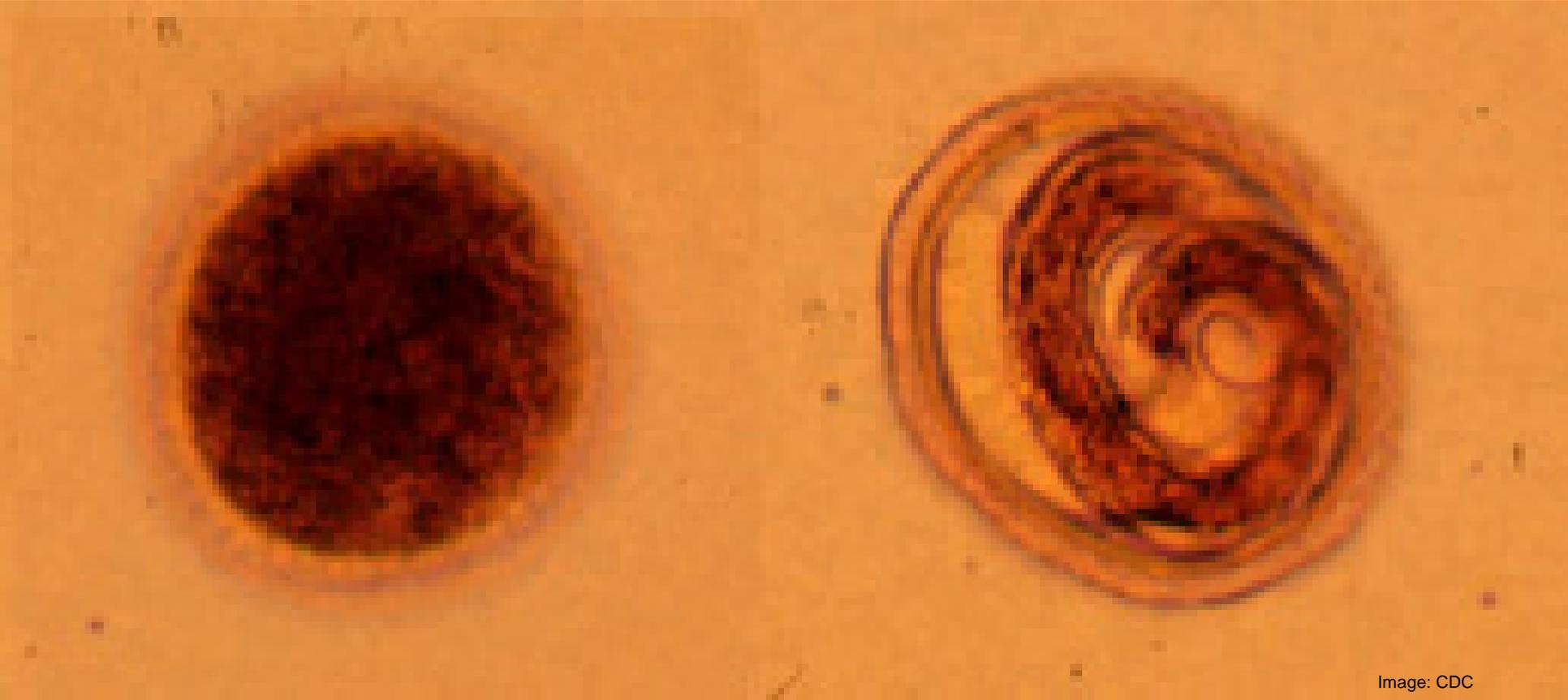
Puppies are a significant source of infection. Prompt removal of dog and cat feces greatly reduces risk of human infection.



Toxocara canis eggs

CDC reports 300,000 human cases annually, 90% of waterborne origin.

Survival outside a host can exceed 6 months – up to four years in soil.



Giardia lamblia cysts

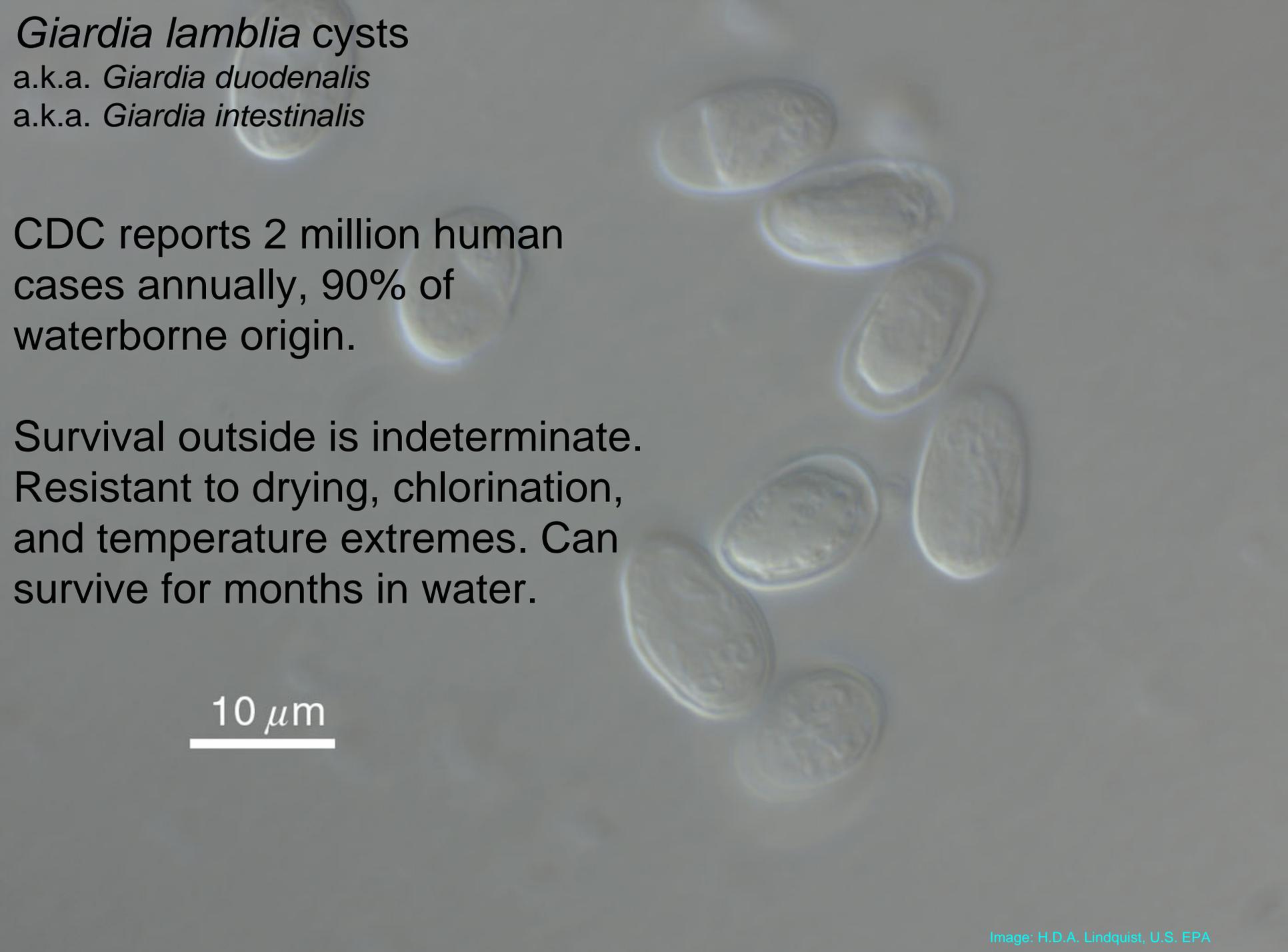
a.k.a. *Giardia duodenalis*

a.k.a. *Giardia intestinalis*

CDC reports 2 million human cases annually, 90% of waterborne origin.

Survival outside is indeterminate. Resistant to drying, chlorination, and temperature extremes. Can survive for months in water.

10 μm

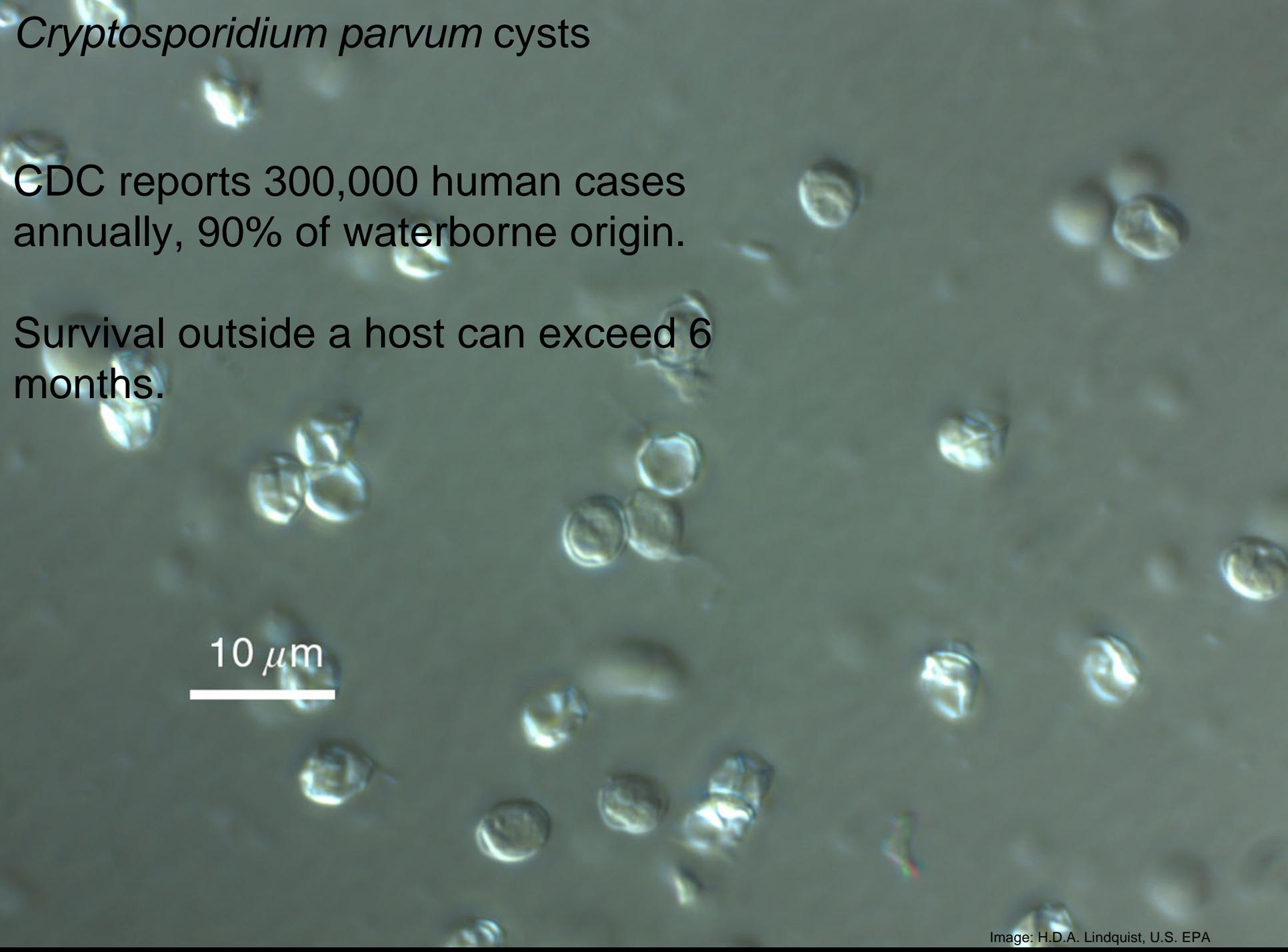
A microscopic image showing several Giardia lamblia cysts. The cysts are oval-shaped with a distinct outer shell and a textured internal structure. A white scale bar is located in the lower-left quadrant, labeled '10 μm'. The background is a light, uniform color.

Cryptosporidium parvum cysts

CDC reports 300,000 human cases annually, 90% of waterborne origin.

Survival outside a host can exceed 6 months.

10 μm

A light micrograph showing numerous oocysts of Cryptosporidium parvum. The oocysts are roughly spherical and appear as clear, refractile bodies with a distinct outer shell. Some oocysts are seen in pairs or small groups. A white horizontal scale bar is located in the lower-left quadrant, labeled '10 μm'. The background is a uniform, light gray color.

Campylobacter jejuni

Campylobacter is one of the most common bacterial causes of diarrheal illness in the United States. About 15 cases are diagnosed annually for each 100,000 persons.



| | | | | | |
|---------|------|--------|-----|------|-----|
| Acc.V | Spot | Magn | Det | WD | Exp |
| 15.0 kV | 4.0 | 9,951x | SE | 10.5 | 1 |

—|—————| 2 μm

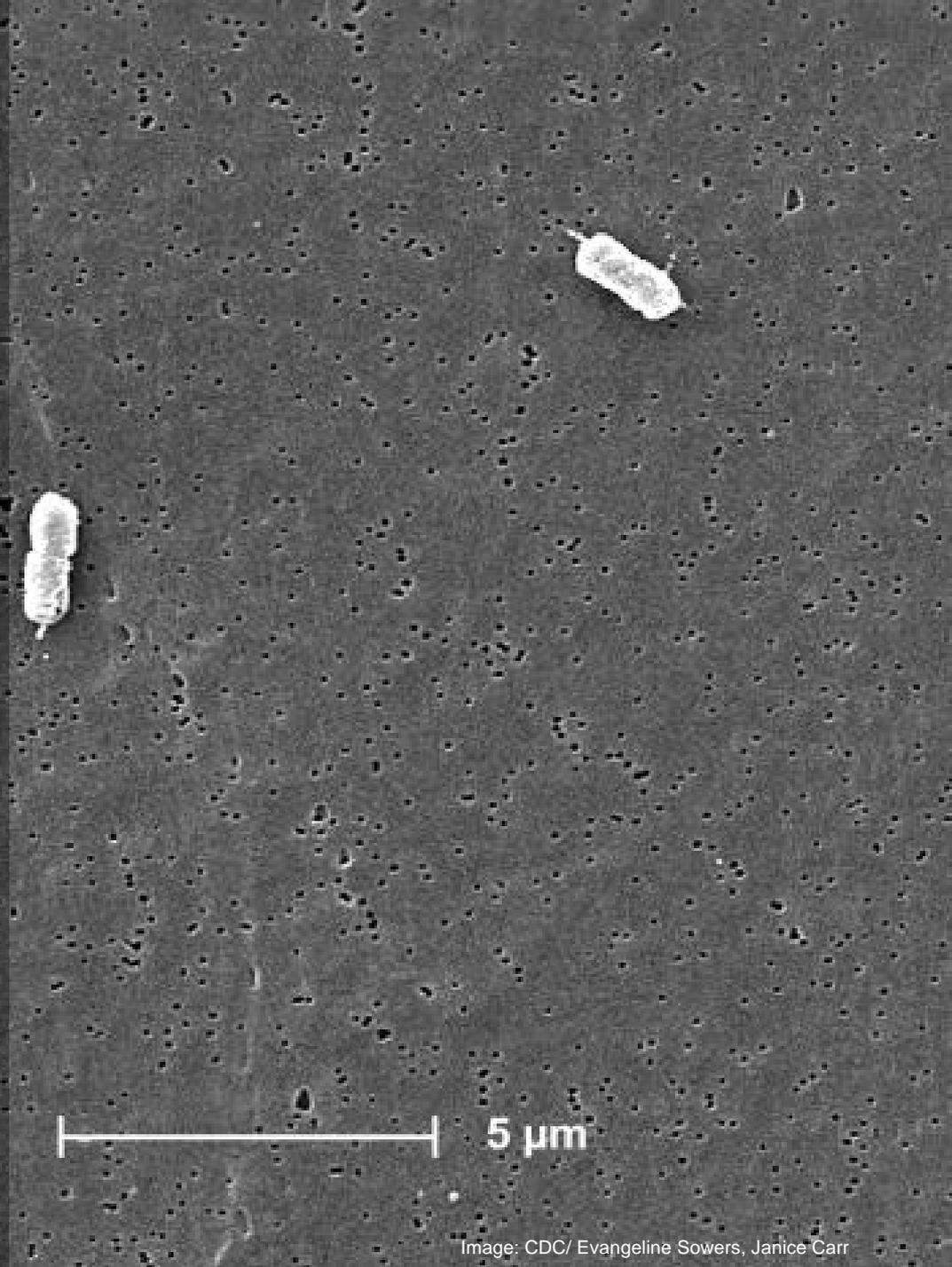
Escherichia coli

Can survive up to four months in feces.

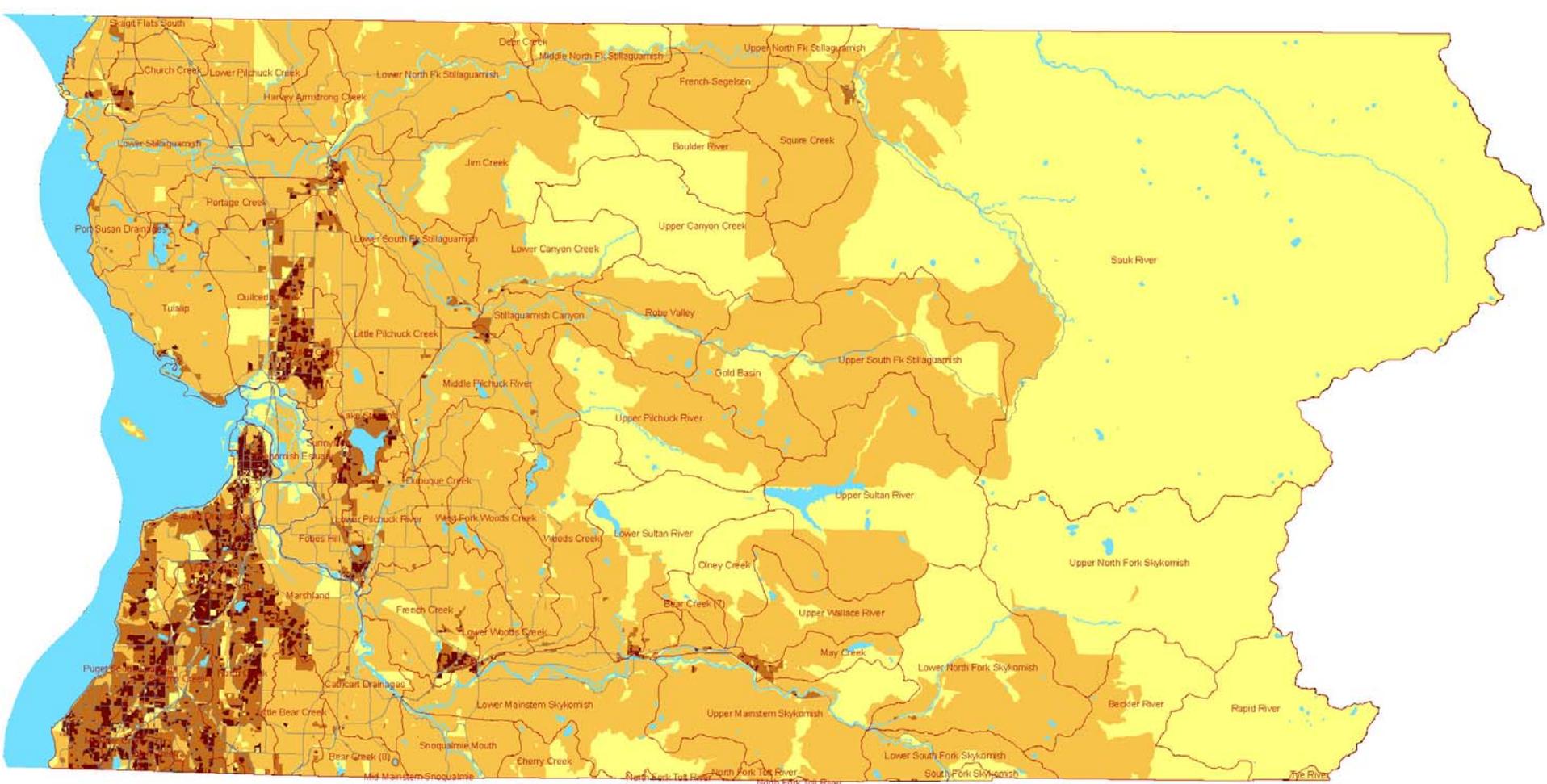
One strain, O157:H7, causes an estimated 73,000 human cases of infection, and 61 deaths in the United States annually.

Most cases are associated with contaminated food, however infection can occur after swimming in or drinking contaminated surface water.

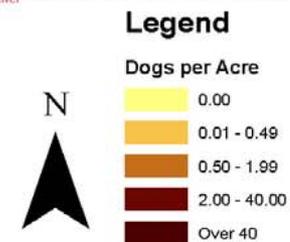
| | | | | | |
|------|------|-------|-----|------|-----|
| c.V | Spot | Magn | Det | WD | Exp |
| 0 kV | 3.0 | 4890x | SE | 11.1 | 3 |



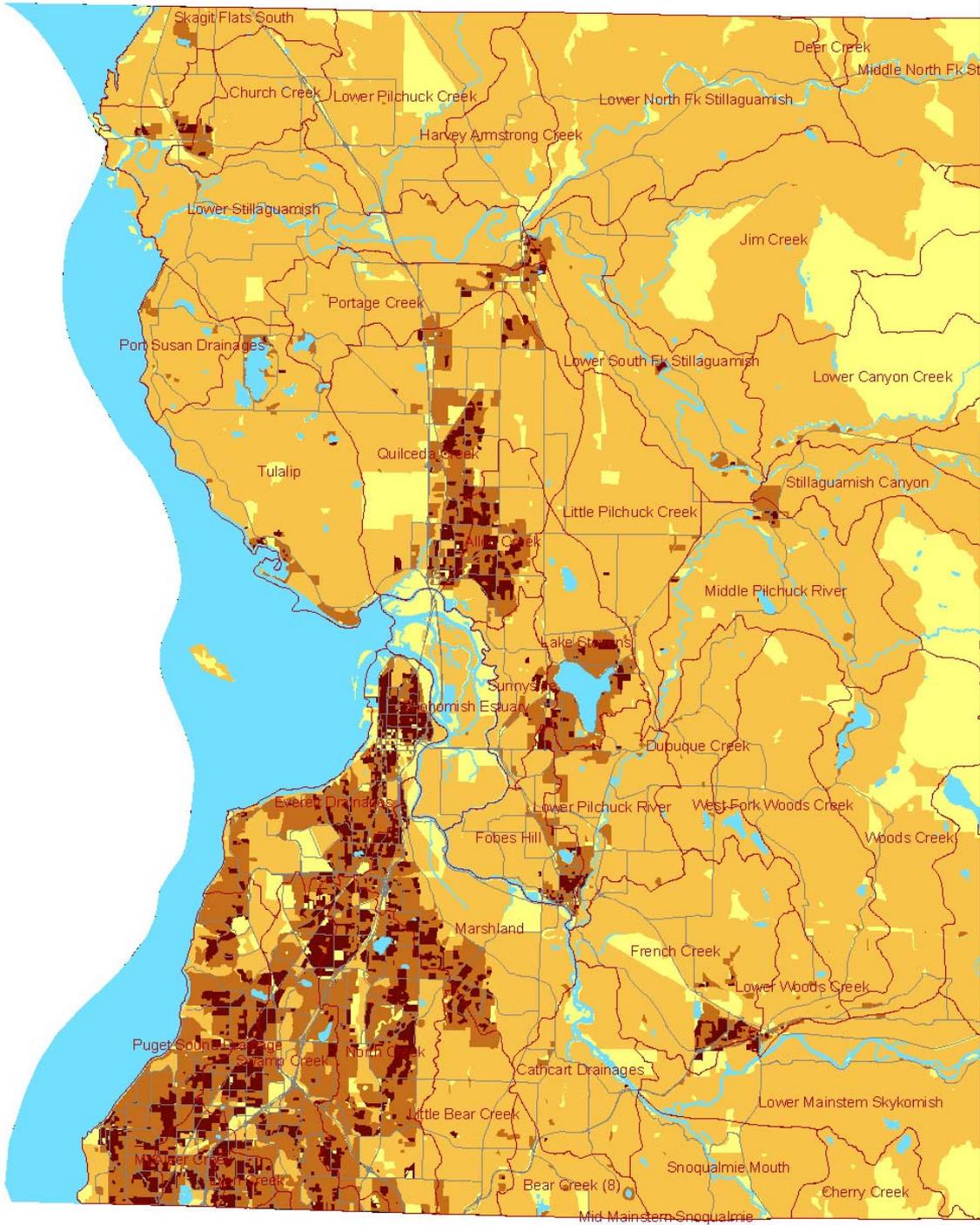


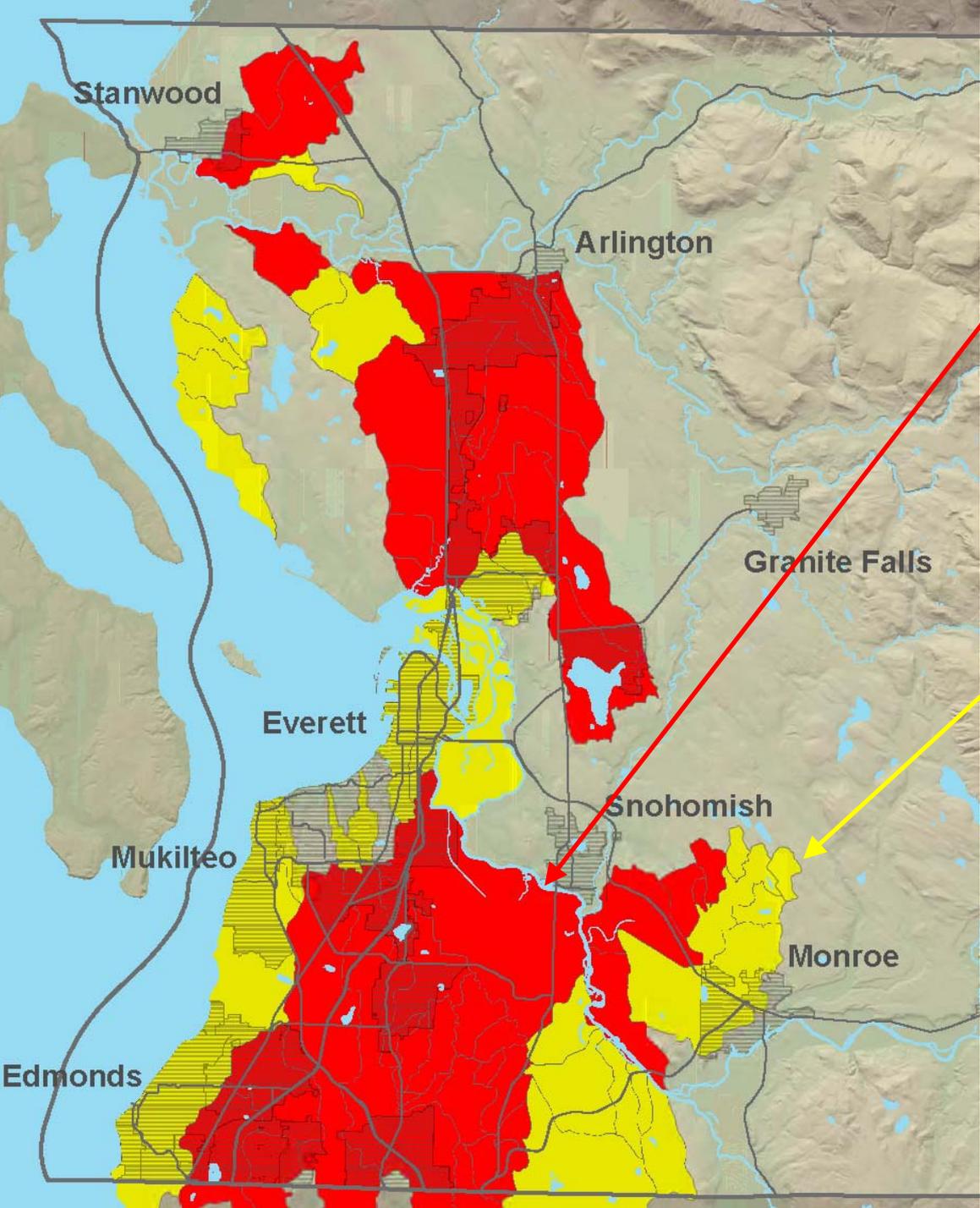


**Snohomish County Dog Population
Dogs per Acre**
Based on INSOURCE 2004 Data



Pet Waste Management Research and Tools
Snohomish County Surface Water Management
Washington State Department of Ecology





Not suitable for swimming or wading

Not suitable for swimming

Formative Research

1. Reviewed pet waste programs in North America, Europe, Australia, New Zealand
2. Reviewed pet waste management research
3. Inventoried pet-oriented businesses
4. Inventoried pet waste cleanup and disposal products
5. Inventoried off-leash areas
6. Conducted focus groups of County residents
7. Conducted a public opinion survey of County residents
8. Analyzed Snohomish County's pet and human demographics
9. Identified problem areas using demographic and water quality data

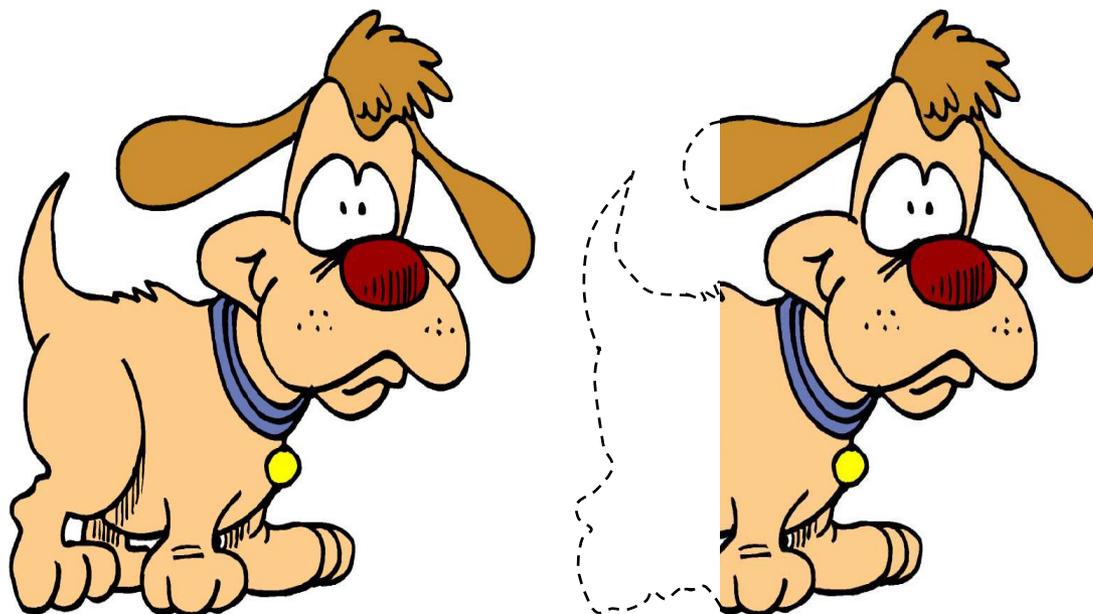
37.4% of Washington households have dogs



American Veterinary Medical Association 2002 data

Pet Waste Management Research and Tools
Snohomish County Surface Water Management
Washington State Department of Ecology

1.5 dogs per dog-owning household in Washington



American Veterinary Medical Association 2002 data

Pet Waste Management Research and Tools
Snohomish County Surface Water Management
Washington State Department of Ecology

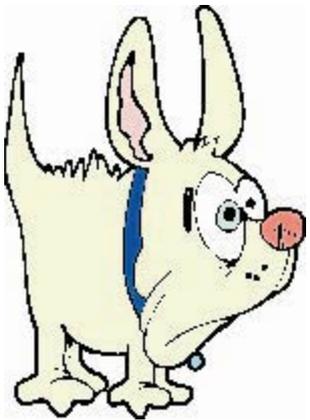
Estimated Countywide Dog Population

224,852 **Snohomish County households**

0.374 **Households with dogs**

X **1.5** **Dogs per dog-owning household**

126,141 **Dogs in Snohomish County**



U.S. Census Bureau 2000 data
American Veterinary Medical Association 2002 data

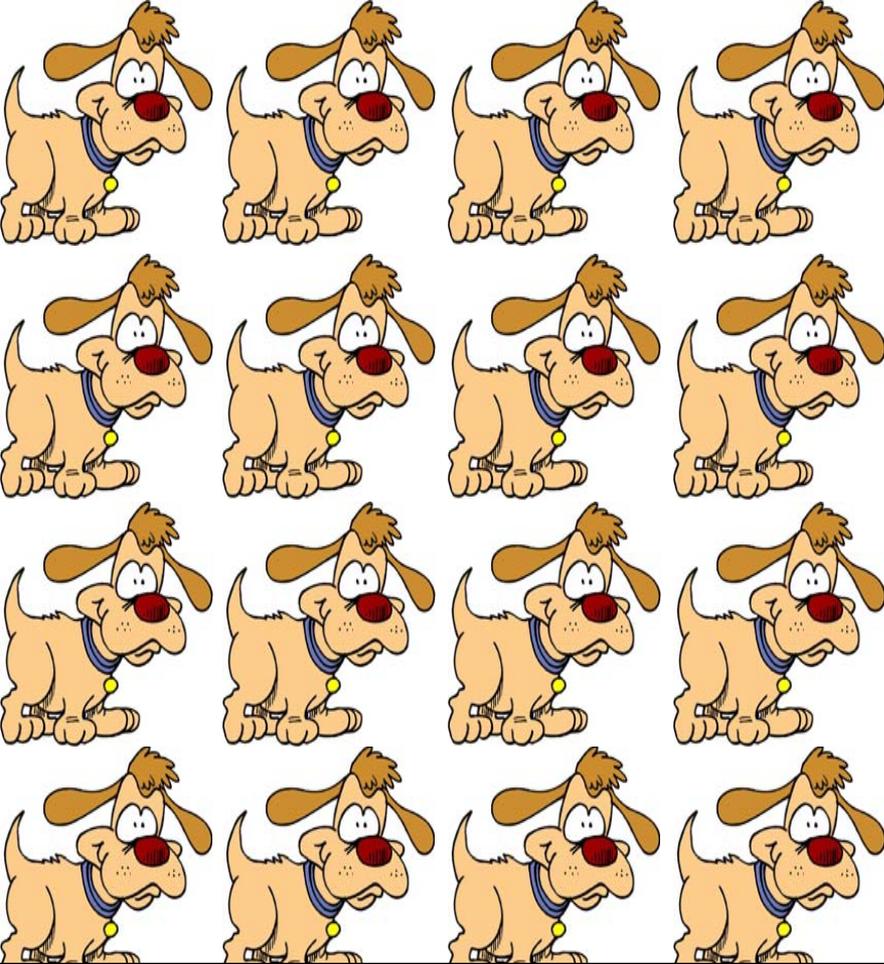
Pet Waste Management Research and Tools

Snohomish County Surface Water Management

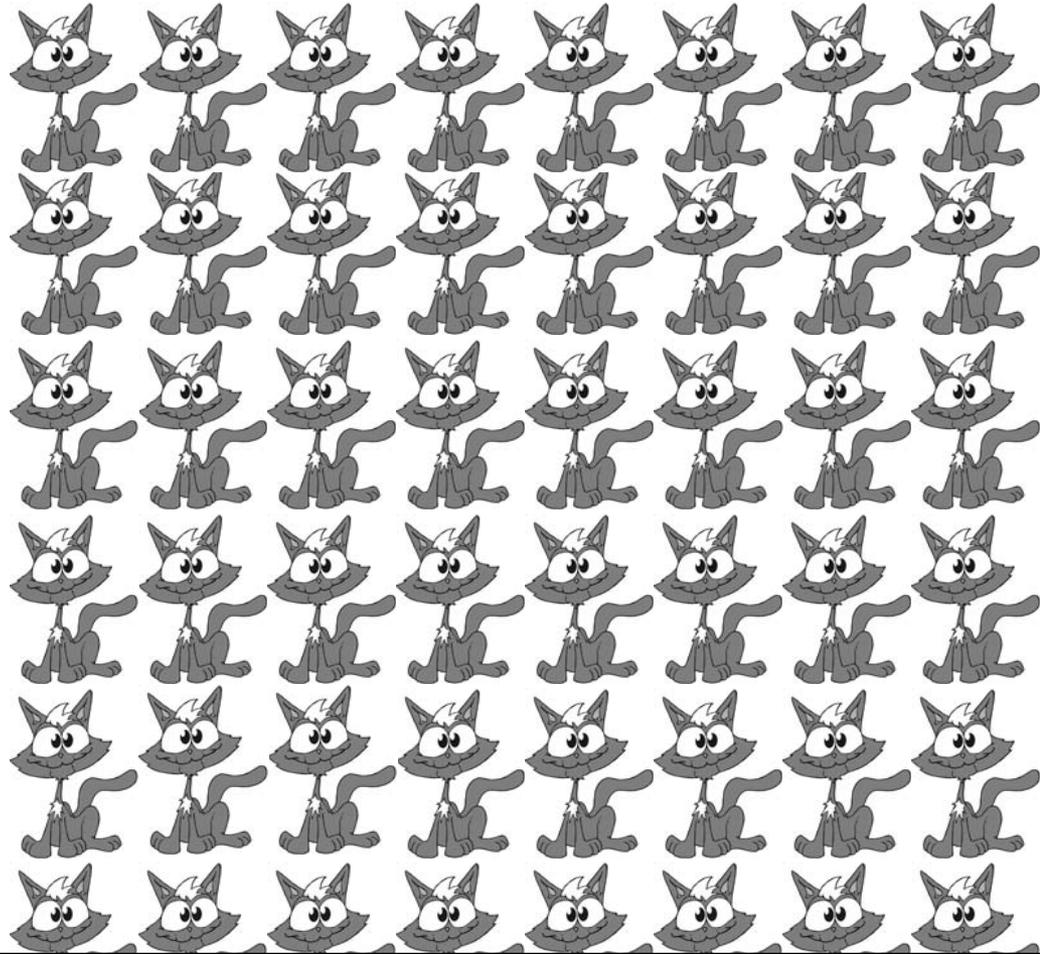
Washington State Department of Ecology

Estimated Countywide Pet Population

126,141 Dogs



206,773 Cats



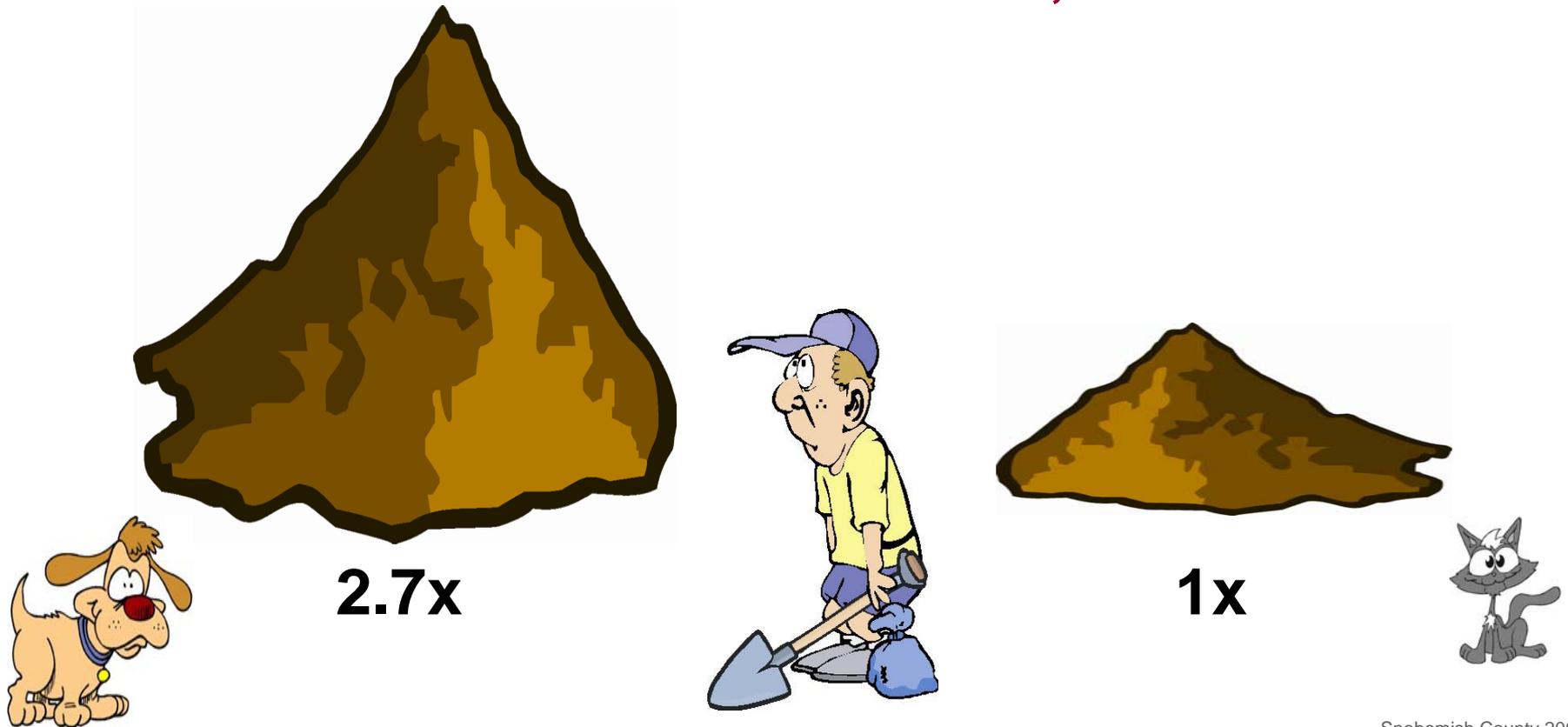
Pet Waste Management Research and Tools

Snohomish County Surface Water Management

Washington State Department of Ecology

Estimated Waste Production

126,000 dogs produce roughly 2.7 times as much solid waste as 206,000 cats

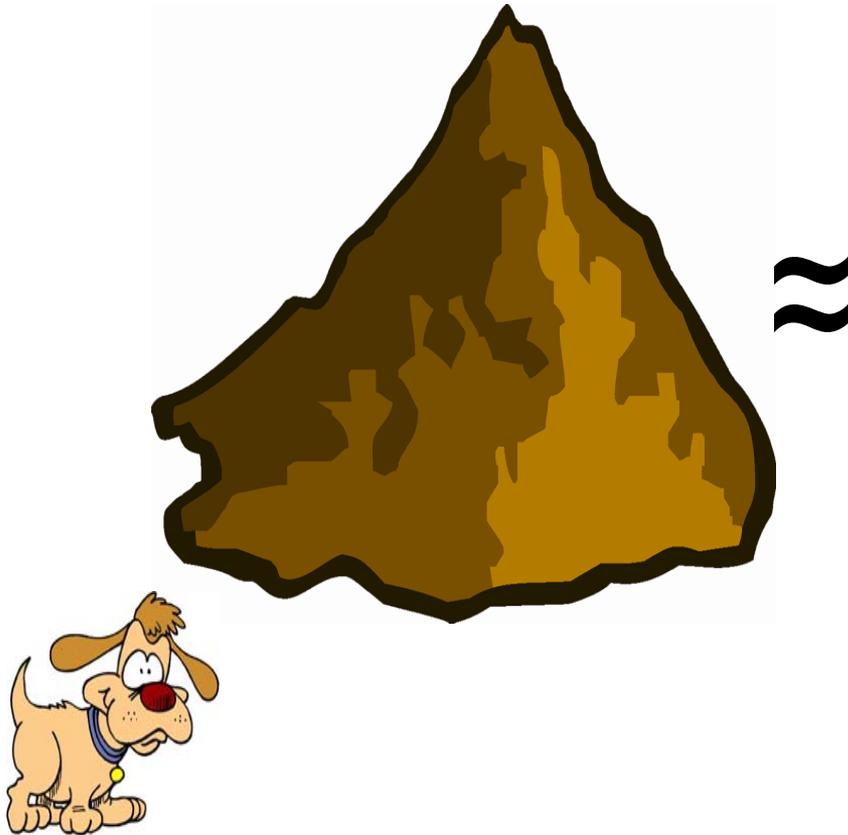


Snohomish County 2005 data

Estimated Waste Production

126,000 Dogs

32,000 People



Snohomish County 2005 data

Pet Waste Management Research and Tools
Snohomish County Surface Water Management
Washington State Department of Ecology

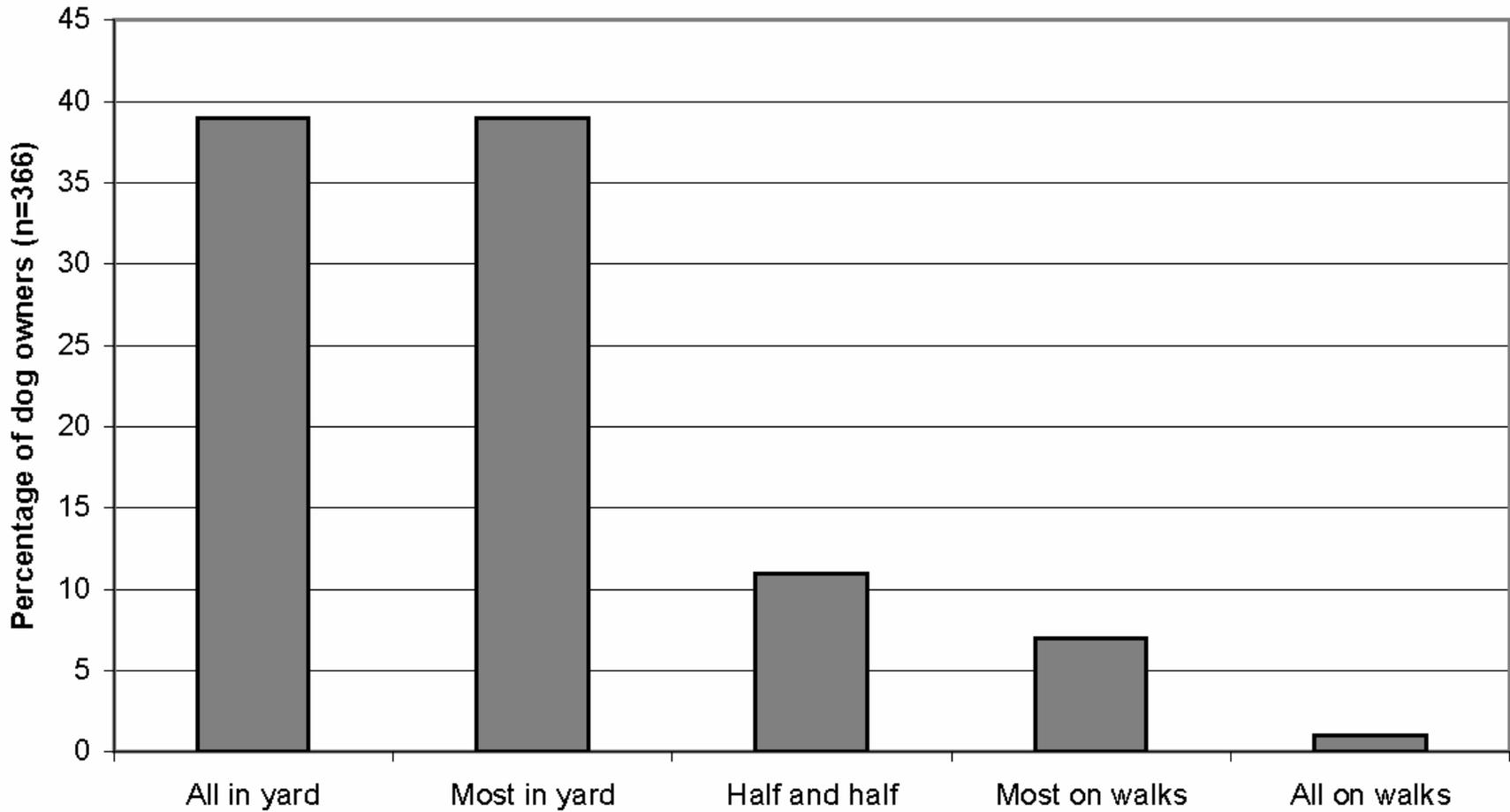
PROGRAM EMPHASIS

Nearly all pet waste programs:

- Are based on primary sanitation program models (not water quality models)
- Emphasize pet waste management in public places – parks, sidewalks, parkways, etc.

Portion of Dog Waste Dropped in Yards and On Walks

Snohomish County Public Works 2004 Data



Pet Waste Management Research and Tools

Snohomish County Surface Water Management

Washington State Department of Ecology

PROGRAM EMPHASIS

Nearly all pet waste programs

- Are based on primary program models (not secondary models)
- Focus on pet waste management in public parks, sidewalks, parkways, etc.

FOCUS ON BACKYARDS



Photo: Dave Ward, Snohomish County

DISPOSAL

The Usual Recommendations

- **Flush the waste down the toilet**
- **Bury the waste**
- **Use digesters or composting devices**
- **Bag the waste and place it in the trash**

Pet Waste Management Research and Tools

Snohomish County Surface Water Management

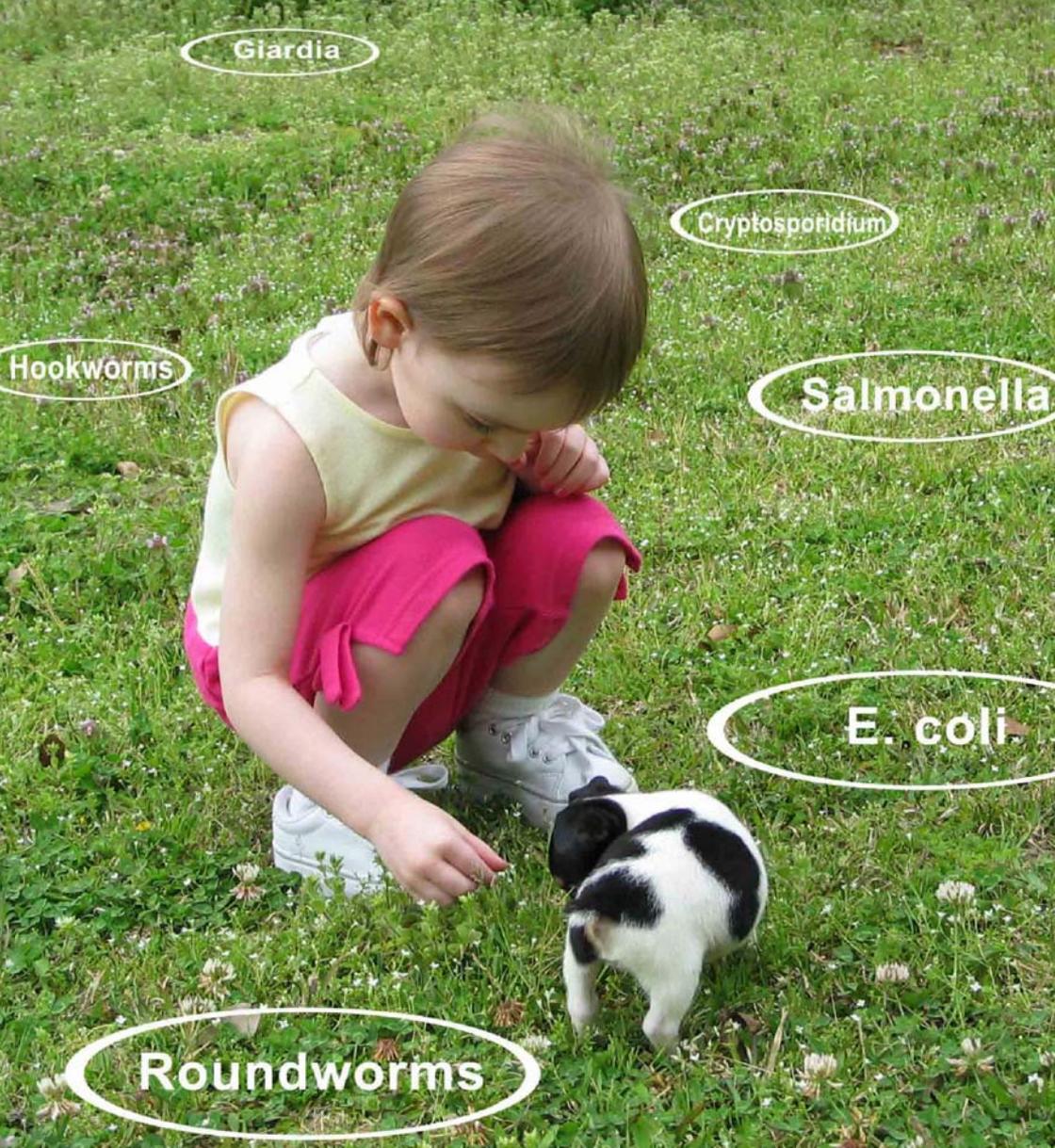
Washington State Department of Ecology

Focus Groups



Telephone Survey





Safe kids

Safe pets

Clean yards

Clean shoes

Pet Waste Management Research and Tools

Snohomish County Surface Water Management

Washington State Department of Ecology

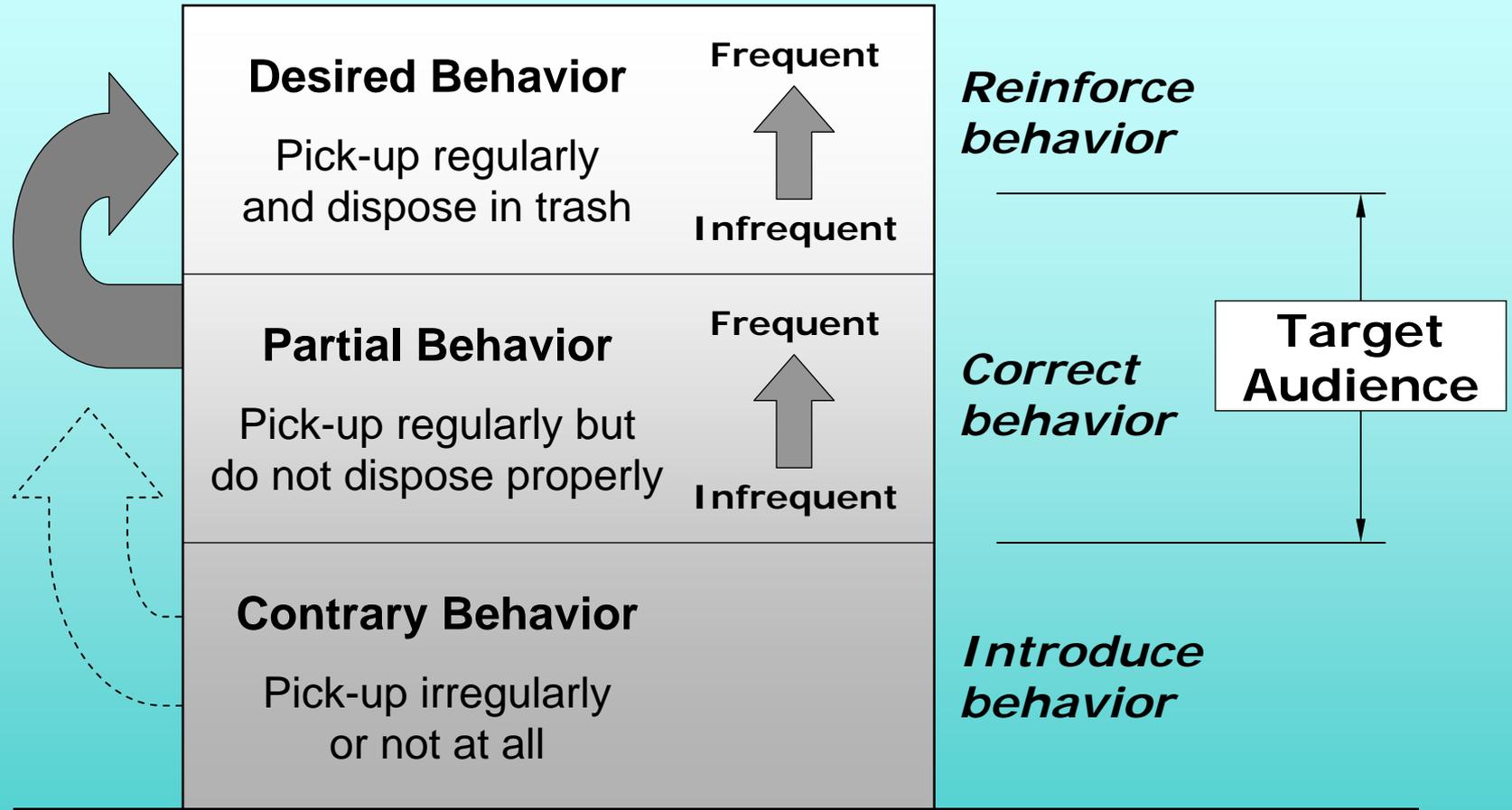
Dog Waste is Not Fertilizer



Dog Waste is Raw Sewage



Target Audience Analysis

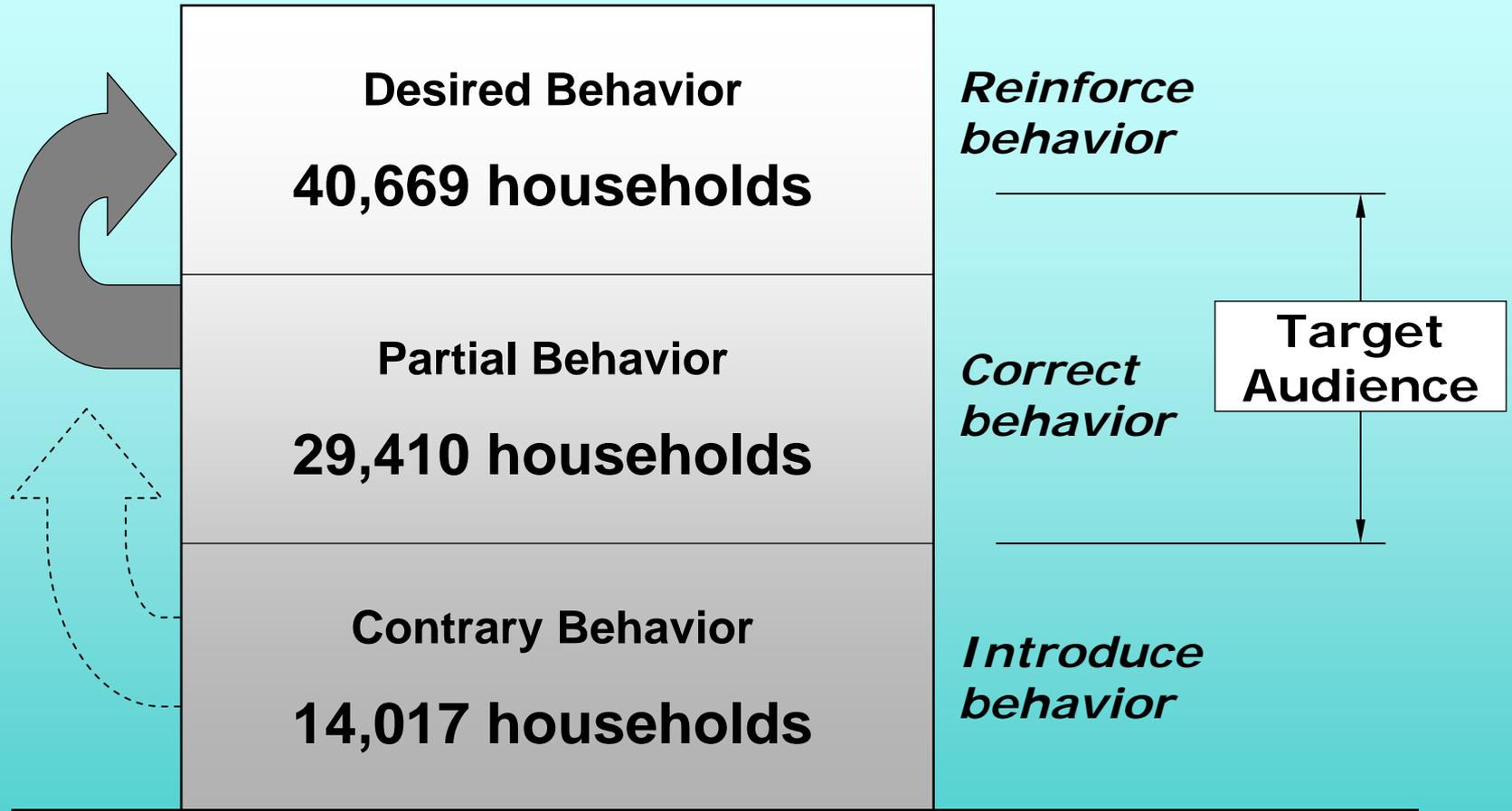


Pet Waste Management Research and Tools

Snohomish County Surface Water Management

Washington State Department of Ecology

Target Audience Analysis



Pet Waste Management Research and Tools

Snohomish County Surface Water Management

Washington State Department of Ecology

Scoop the poop,
bag it,
place it in the trash





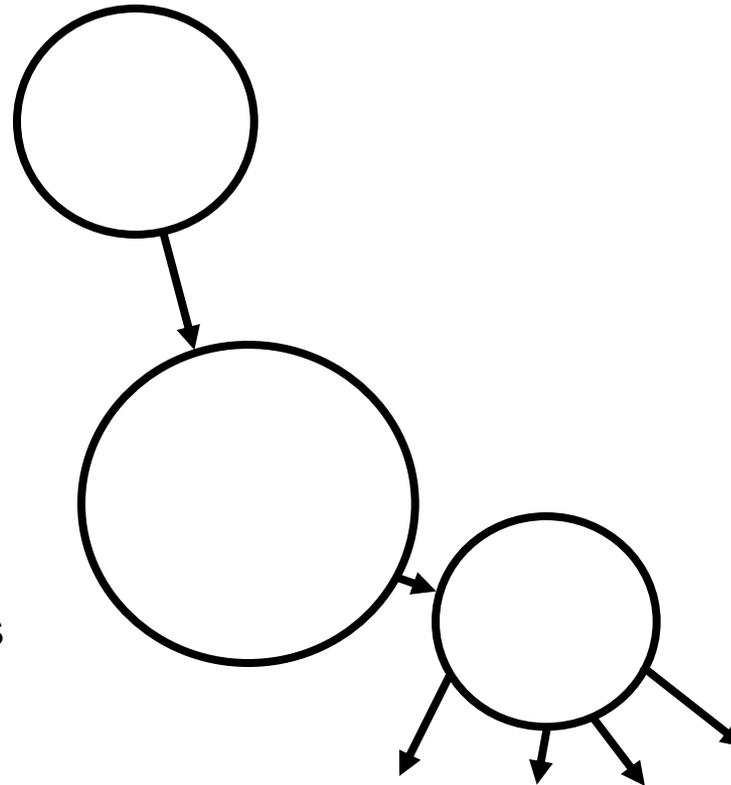
Pet Waste Pilot Program

Formative Research

Audience Research
Message Development
Program Design
Evaluation Strategy

Body of Program

Implement Communications
Test Methodologies
Aggressive Monitoring
Evaluation of Methodologies



Program Outputs

Methodology
Theoretical Foundation
Evaluative Foundation
Communication Tools
Proven Results

Dissemination of Outputs

Distribute to Public Agencies



Pet Waste Pilot Program

Formative Research

Audience Research
Message Development
Program Design
Evaluation Strategy



Body of Program

Implement Communications
Test Methodologies
Aggressive Monitoring
Evaluation of Methodologies

Program Outputs

Methodology
Theoretical Foundation
Evaluative Foundation
Communication Tools
Proven Results

Dissemination of Outputs

Distribute to Public Agencies

Excuse me. Can we talk?



More than 126,000 dogs live in Snohomish County.
That's an entire city's worth of untreated raw sewage sitting in our backyards.

**Scoop the poop,
bag it,
and place it in the trash.**

Clean yards. Clean streams. (And clean paws!)

**101 REASONS TO PICK UP PET WASTE:
NUMBER 75**

Dog Poetry

If taking care of number two
is number one to you,
then picking up your doggy doo
should matter lots to you.



Doogies don't just fade away
or fertilize the grass;
lawn sausages will keep for weeks
releasing noxious gas.



About the time you think they're gone
they've only just begun,
emitting bad bacteria
and foul things one by one.

Cam-py-lo-bac-ter-i-a
and E. co-li are bad;
Giardia may sound like fun
But it will make you sad.

The rains, they come and wash the dung
just as it turns ripe,
down a swirling storm drain
and out into a pipe.

The pipe goes on for miles and miles
or further it may seem,
and then it pumps the poopie out
right into a stream!

Nuggets don't belong in streams
where salmon try to swim;
some day that fish could be your meal
on a hungry whim.

So scoop the poop and bag it
and place it in the trash;
your doggy doo reflects on you,
It's what your puppy passed!



More than 126,000 dogs live in Snohomish County.
That's an entire city's worth of untreated raw sewage sitting in our backyards.

Scoop the poop, bag it, and place it in the trash

Clean yards. Clean streams. (And clean shoes!)

**101 REASONS TO PICK UP PET WASTE:
NUMBER 91**

It's the American Way

Scoop the poop, bag it, and place it in the trash

Enjoy your holiday the healthy way!

Use these handy blue bags to pick up your dog's waste with less mess!

Harmful organisms in pet waste can persist for weeks in your yard, posing serious health risks to your family and pets.

Eliminate this foul problem by scooping dog poop from your yard at least once a week.

Enjoy a fun, safe, disease-free holiday. Happy scooping!

If you don't own a dog, please give this bag to a neighbor who does. Thank you!

Learn more at: www.petwaste.surfacewater.info

Snohomish County Public Works Surface Water Management

Happy Thanksgiving

Don't let your dog be a turkey

Pet waste is not just an embarrassment for your dog. It's a health issue for your whole family.

Roundworms, E. coli, and Giardia are just a few of the harmful organisms that can be transmitted from dog waste to people.

Use this magnet as a reminder to scoop the poop at least once a week.

Protect your family. They'll thank you for it!

Scoop the poop, bag it, and place it in the trash

Clean yards. Clean streams. (And clean shoes!)

www.petwaste.surfacewater.info

IT'S OKAY!

Scoop the poop, bag it, and place it in the trash

More than 126,000 dogs live in Snohomish County. That's an entire city's worth of raw sewage sitting in our backyards.

Landfills are designed to safely handle substances such as dog waste and cat litter. Yards are not.

Surface Water Management
www.petwaste.surfacewater.info

Some things last longer than you think

Harmful organisms can be transmitted from dog waste to children. Some can persist for weeks in yards and streams, waiting for a host. Roundworms, E. coli, and Giardia are just a few of the harmful organisms that can be transmitted from dog waste to people.

The solution is easy:

Scoop the poop, bag it, and place it in the trash

Clean yards. Clean streams. (And clean shoes!)

Surface Water Management
www.petwaste.surfacewater.info

Dogs can't flush!

Roundworms, E. coli, and Giardia are just a few of the harmful organisms that can be transmitted from dog waste to people. Some can live for weeks in your soil. Landfills are designed to safely handle substances like dog waste and cat litter. Yards are not.

So until your pup learns to use the toilet, please:

Scoop the poop, bag it, and place it in the trash

Clean yards. Clean streams. (And clean paws!)

Surface Water Management
www.petwaste.surfacewater.info

School days are here!

But some things dogs will never learn...

The school year is here! Equip the students in your household. Return this card for a FREE pet waste pent (and other fun trinkets for school!)

Quantities are limited so don't delay!

Name _____
Address _____
City _____ State _____ Zip _____
Phone _____ Email _____

Yes! I'm a Scooper! Please send me a free pet waste pent!

Please call me. I have questions!

Put me on your mailing list for classes and workshops!

What's the problem with 20 tons of dog poop?

That's like an entire city's raw sewage sitting in our backyards!

Harmful organisms can be transmitted from dog waste to children. Some can persist for weeks in your yard, waiting for a host.

Landfills are designed to safely handle substances such as dog waste and cat litter. Yards are not. Burying or composting pet waste allows harmful organisms into groundwater.

Scoop the poop, bag it, and place it in the trash

Clean yards. Clean streams. (And clean paws!)

Surface Water Management
www.petwaste.surfacewater.info

What's the problem with 20 tons of dog poop?

Daylight savings time is coming to an end. You'll need light to scoop at night!

Return this card for a FREE scooper light!

Quantities are limited, so don't delay!

Name _____
Address _____
City _____ State _____ Zip _____
Phone _____ Email _____

Yes! I'm a Scooper! Please send me a free scooper light!

Please call me. I have questions!

Put me on your mailing list for classes and workshops!

Surface Water Management
www.petwaste.surfacewater.info

Summer is here!

Return this card to receive a free Scooper Water Bottle. Perfect for staying hydrated while scooping your yard!

Quantities are limited. Don't delay!

Name _____
Address _____
City _____ State _____ Zip _____
Phone _____ Email _____

Yes! I'm a Scooper! Please send me a free water bottle!

Please call me. I have questions!

Put me on your mailing list for classes and workshops!

Over 20 tons of dog waste are dropped in Snohomish County every day!

Surface Water Management
www.petwaste.surfacewater.info

Daylight savings time is coming to an end. You'll need light to scoop at night!

Return this card for a FREE scooper light!

Quantities are limited, so don't delay!

Name _____
Address _____
City _____ State _____ Zip _____
Phone _____ Email _____

Yes! I'm a Scooper! Please send me a free scooper light!

Please call me. I have questions!

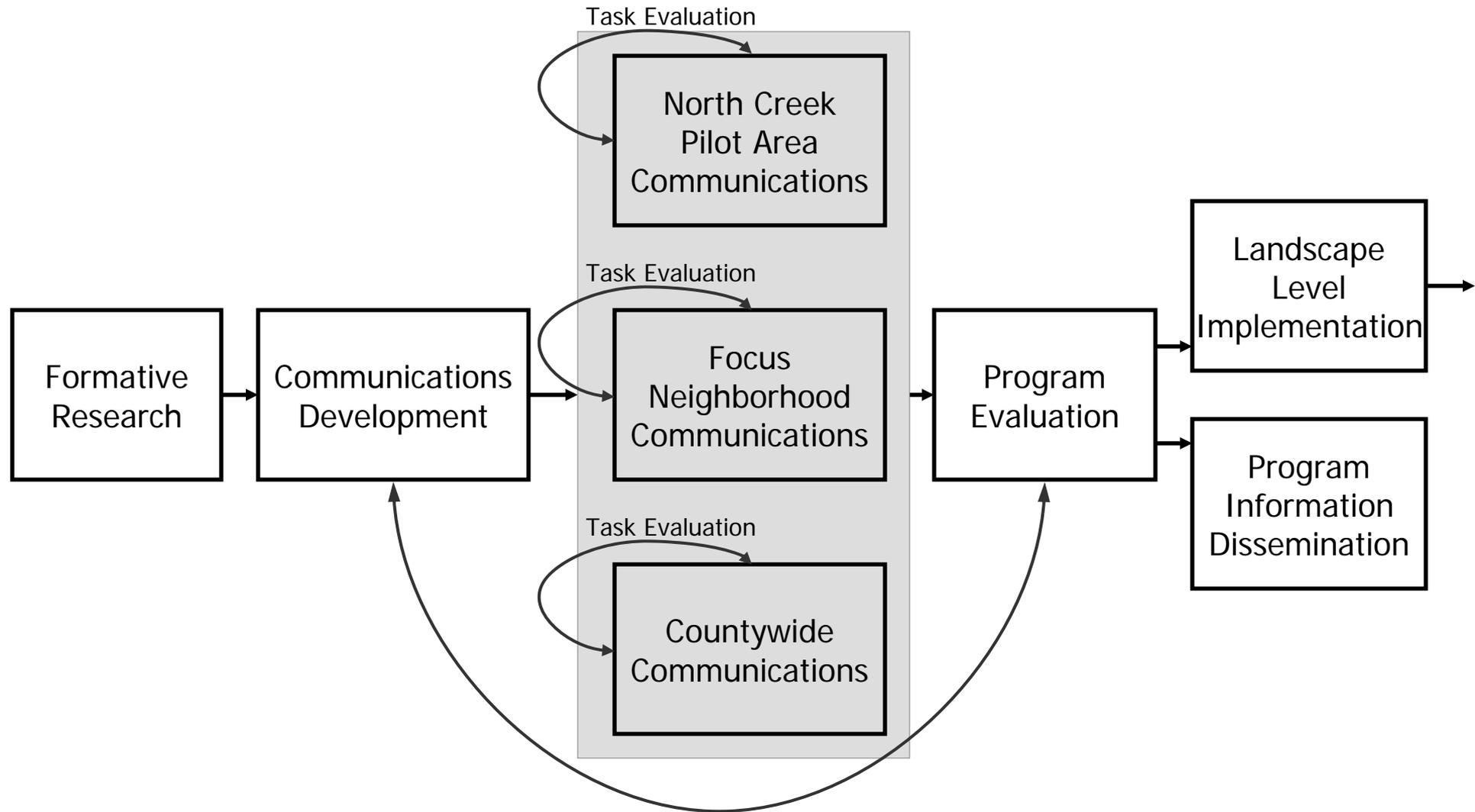
Put me on your mailing list for classes and workshops!



**This is a
BEHAVIOR CHANGE
program,**

not an education program

Program Model

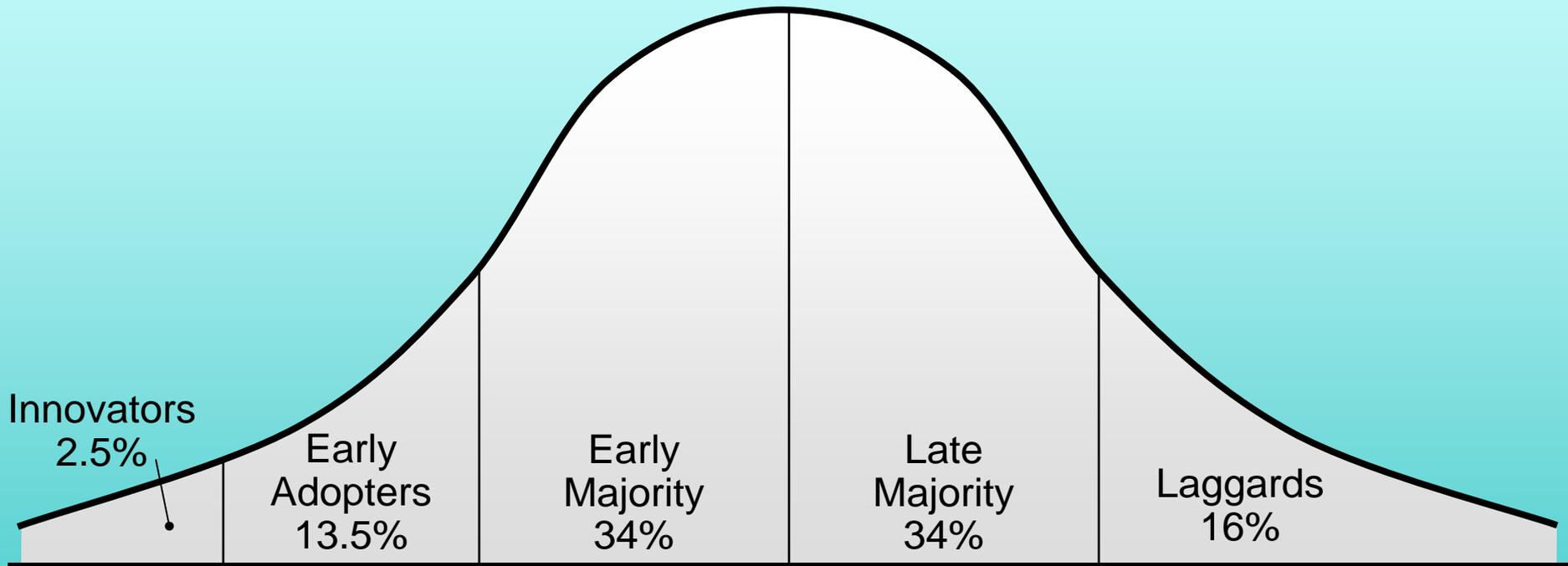


Pet Waste Management Research and Tools

Snohomish County Surface Water Management

Washington State Department of Ecology

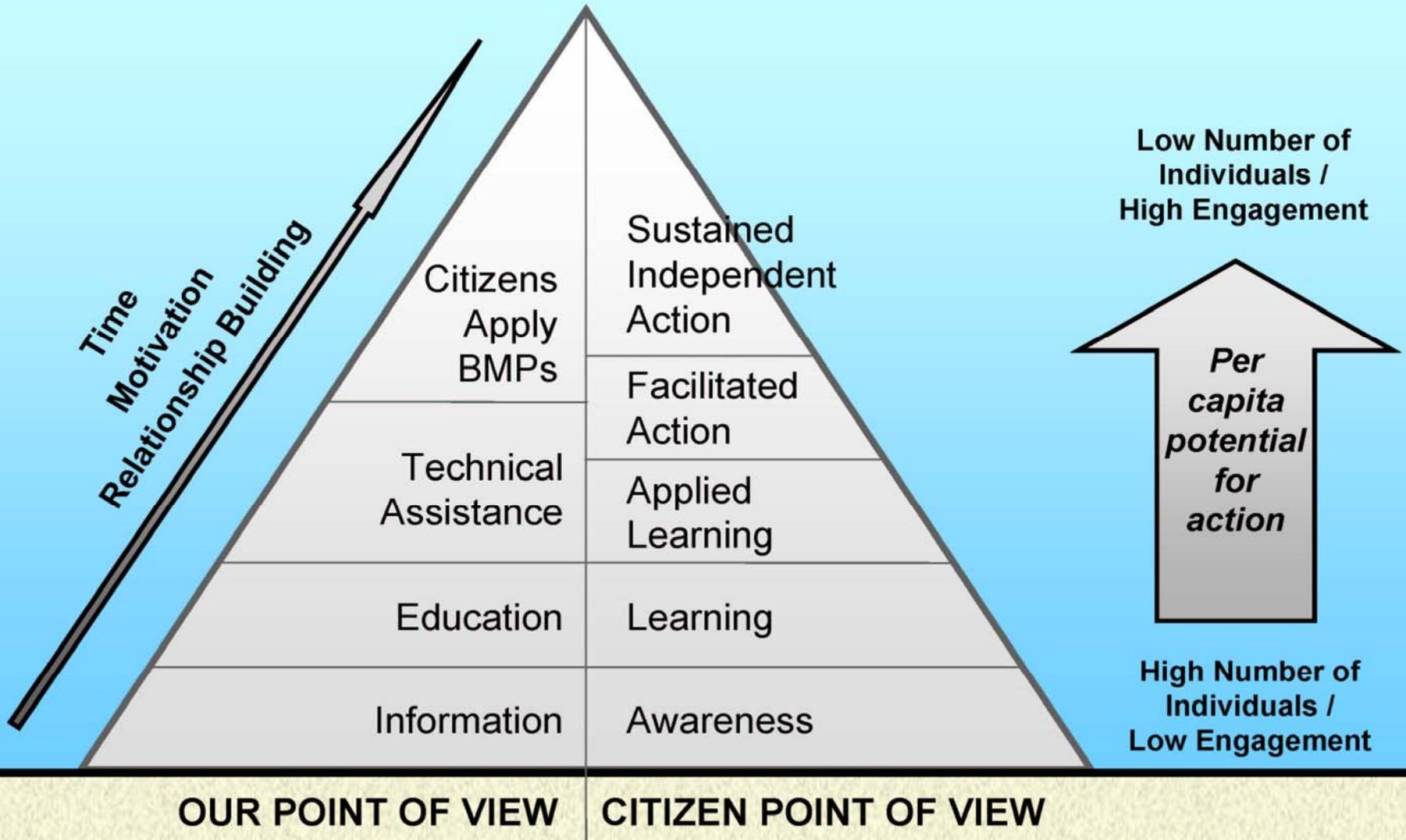
Diffusion of Innovations



Graphic based on Everett Rogers, Diffusion of Innovations, 1962, 2003

Pet Waste Management Research and Tools
Snohomish County Surface Water Management
Washington State Department of Ecology

Public Involvement Continuum



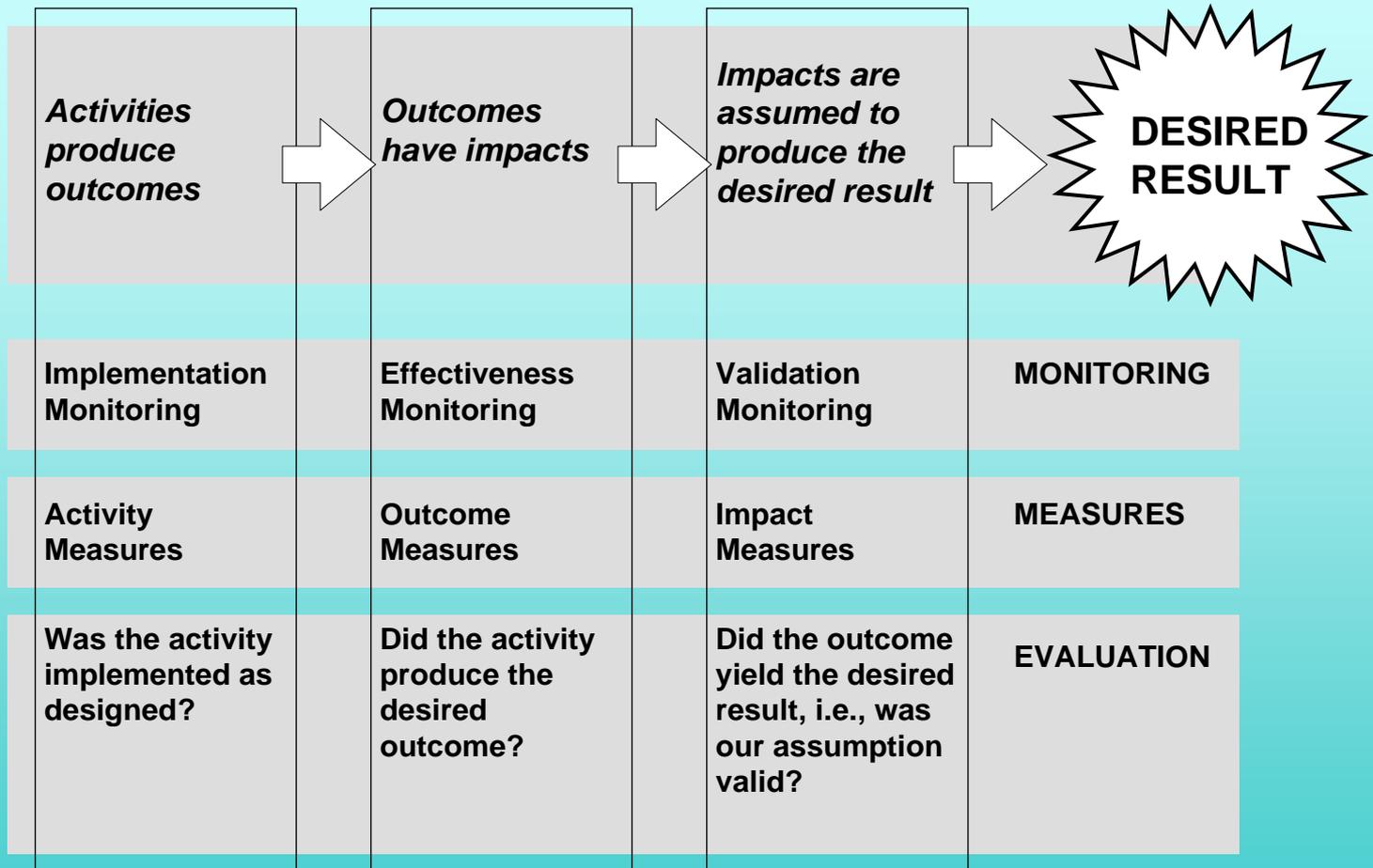
Graphic: Snohomish County Surface Water Management

Pet Waste Management Research and Tools

Snohomish County Surface Water Management

Washington State Department of Ecology

Program Evaluation and Monitoring

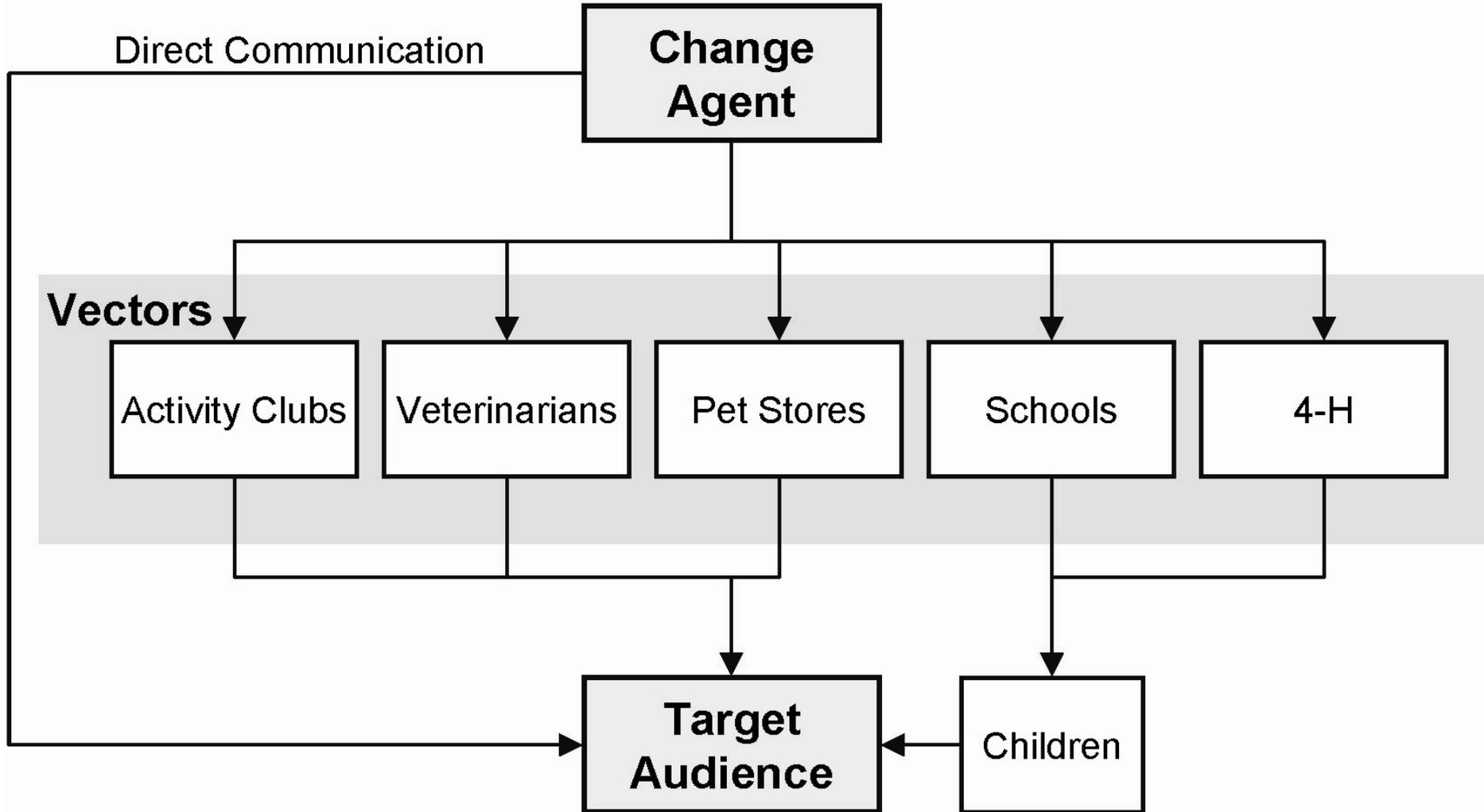


Pet Waste Management Research and Tools

Snohomish County Surface Water Management

Washington State Department of Ecology

Communications Strategy

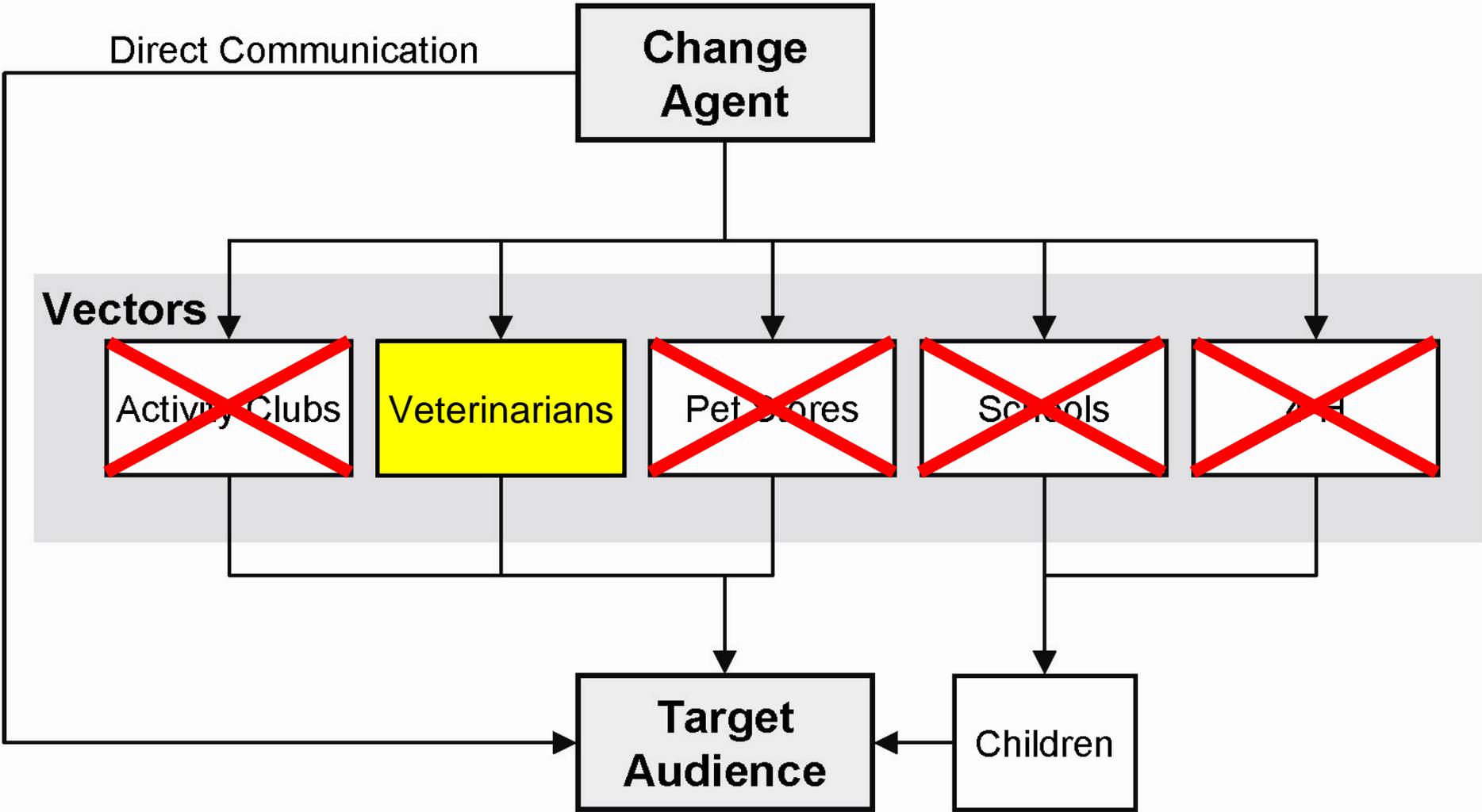


Pet Waste Management Research and Tools

Snohomish County Surface Water Management

Washington State Department of Ecology

Communications Strategy



Pet Waste Management Research and Tools

Snohomish County Surface Water Management

Washington State Department of Ecology

BEHAVIOR CHANGE

Pet Waste Management Research and Tools
Snohomish County Surface Water Management
Washington State Department of Ecology

Have Fun!!



*Pet Waste Management Research and Tools
Snohomish County Surface Water Management
Washington State Department of Ecology*

Even if it smells like a rose, it's still sewage



SCRATCH & SNIFF

More than 126,000 dogs live in Snohomish County.
That's an entire city's worth of untreated raw sewage sitting in our backyards.

Scoop the poop, bag it, and place it in the trash

Clean yards. Clean streams. (And clean shoes!)

**101 REASONS TO PICK UP PET WASTE:
NUMBER 7**