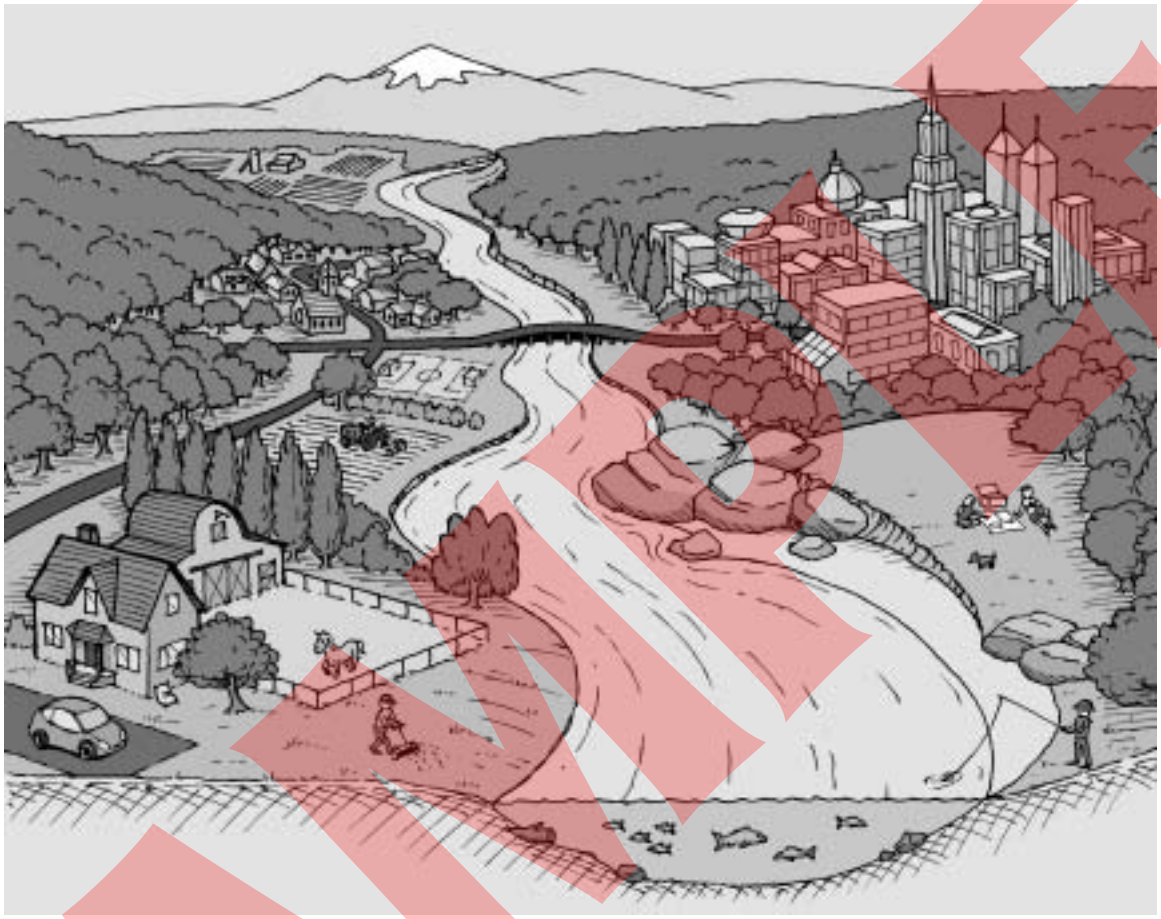
Snohomish County 4-H'ers for Clean Water



Guide to Healthy Horsekeeping

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This manual is part of the 4-H'ers for Clean Water program being implemented by the Snohomish Conservation District. The 4-H'ers for Clean Water program provides information to 4-H members about easy things they can do to help keep our water clean. Visit *http://www.snohomishcd.org/* for more information about the Snohomish Conservation District and visit *http://snohomish.wsu.edu/4hmain.htm* for more information about the Snohomish County 4-H Program

This manual was developed by Horses for Clean Water through a grant administered by the Snohomish Conservation District. Horses for Clean Water is a program developed by horse owners for horse owners. Our mission is to help other horse owners manage their land in the best way possible for horse health and the environment. For more information on Horses for Clean Water and education schedules contact Alayne Blickle at 425-432-6116 or check out the website at: *http://www.horsesforcleanwater.com/*

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Introduction

Welcome to the 4-H'ers for Clean Water Guide to Healthy HorseKeeping. In this manual you will learn about things you can do around your horse place that are good for your horse's health AND good for the health of the environment—we call this Healthy HorseKeeping. And the really good news is that Healthy HorseKeeping can also make your chores easier and save you money! By the time you finish this manual you will have learned lots of ways to protect your horse's health, help fish and wildlife, and keep our water clean.

Choosing a Project Leader

You'll want to find a Project Leader who can help you as you go through this manual. You might choose a family member, 4-H leader, teacher, or a friend. Find a Project Leader that can:

1. Review this manual.
2. Support your efforts to set goals and complete the activities in this manual.
3. Help you connect with resources and people knowledgeable about Healthy HorseKeeping.
4. Sign off on the activities you have completed.

Activities in this Manual

In each chapter there are activities for you to complete that will help you put your new Healthy HorseKeeping skills into action. The "Activity Tracking" section on the next few pages will show you how many activities to complete for each chapter. In this section you will also find a Certificate of Completion where you can get a seal when you complete the required activities in each chapter. See if you can get a seal for all six chapters!

Note to 4-H Leaders

This manual was developed as one part of a larger project to provide environmentally friendly horse-keeping education to 4-H members. The project will run through 2006 and also includes a Healthy HorseKeeping Checklist (as a companion to the manual), 4-H leader training workshops, farm tours, and workshops on subjects such as mud, manure, and pasture management.

The activities in this manual can be used as part of a merit badge program. For example, at the time of this manual printing, Snohomish County 4-H Horse Program Members can receive a merit badge by doing the following:

- Attending workshops on mud, manure, and pasture management.
- Attending farm tours.
- Completing the Healthy HorseKeeping Checklist.
- Completing the required number of activities in the manual. (See the "Activity Tracking" pages to see how many activities are required for each chapter.)
- Doing a presentation at a club meeting or other venue on a Healthy HorseKeeping practice. For example, a 4-H'er might explain how they participated in a stream-planting project or began composting their horse manure.

If you would like to include workshops and farm tours as part of your merit badge program, contact the Snohomish Conservation District or Horses for Clean Water to see if these events are currently being held in your area.

Activity Tracking

Chapter 1

Healthy HorseKeeping Basics

Complete at least three of the five activities in this chapter.

Activity	Date Completed	Project Leader Initials
1-1 Mud and Horse Health		
1-2 Pointing Out Pollutants		
1-3 Keeping Soil in Place		
1-4 Manure in Water, Manure on Land		
1-5 Know Your Source		

Chapter 2

Conquering Mount Manure

Complete at least six of the eight activities in this chapter.

Activity	Date Completed	Project Leader Initials
2-1 Developing a De-worming Program		
2-2 Stall Mat Match-Up		
2-3 Trying Wood Pellets		
2-4 Picking a Place for Manure		
2-5 Tarping a Mini 'Manure' Pile		
2-6 Compost Fill-in		
2-7 Judging a Compost Pile		
2-8 Taking Your Compost Pile's Temperature		

Chapter 3
Tackling Mud

Complete at least six of the eight activities in this chapter.

Activity	Date Completed	Project Leader Initials
3-1 Winter Living Space		
3-2 Planning Your Winter Paddock		
3-3 Edible Soil Compaction		
3-4 Soil Absorption Rates		
3-5 Choosing Your Footing		
3-6 Calculating Runoff from Your Roof		
3-7 Contacting Your Conservation District		
3-8 Planting a Tree		

Chapter 4
Perfect Pastures

Complete at least two of the four activities in this chapter.

Activity	Date Completed	Project Leader Initials
4-1 Measuring the Grass in Your Pastures		
4-2 Dividing Your Pastures		
4-3 Naming Poisonous Plants		
4-4 Identifying Weeds in Your Pasture		

Chapter 5
Clean Streams

Complete at least two of the three activities in this chapter.

Activity	Date Completed	Project Leader Initials
5-1 Stream Fill-in		
5-2 Identifying Healthy Streams		
5-3 Stream Planting Project		

Chapter 6
Making a Place for Wildlife

Complete at least three of the five activities in this chapter.

Activity	Date Completed	Project Leader Initials
6-1 Putting Up a Bird House		
6-2 Building & Observing Brush & Rock Piles		
6-3 Wildlife Fill-in		
6-4 Drawing a Wildlife Habitat Map		
6-5 Pest Check		

Snohomish 4-H'ers

Certificate Of Completion

(Name)

has completed the required activities in the following chapters:

Chapter 1 Healthy HorseKeeping Basics	Chapter 2 Conquering Mount Manure	Chapter 3 Tackling Mud	Chapter 4 Perfect Pastures	Chapter 5 Clean Streams	Chapter 6 Making a Place for Wildlife
Place Seal Here	Place Seal Here	Place Seal Here	Place Seal Here	Place Seal Here	Place Seal Here

HORSES for clean water

Healthy HorseKeeping Basics

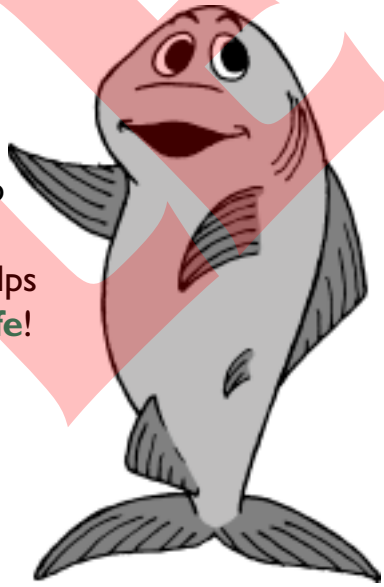
The Four H's of Healthy HorseKeeping

Head

Healthy HorseKeeping makes sense because it saves me **money** on things like feed and veterinarian bills. It also makes sense because it protects the **water that I drink**.

Heart

Healthy HorseKeeping doesn't just help you and your horse, it also helps **fish and wildlife**!



Hands

By fixing my mud and manure problems, my daily chores are **easier and faster**!

Health

Healthy HorseKeeping not only protects the health of the environment, it also protects **horse health**!

Why Healthy HorseKeeping Is Important for HORSE HEALTH!

When horses overgraze pastures they can end up ingesting dirt which can lead to **sand colic**.

Mud can increase your horse's chance of getting **hoof abscesses**, **mud fever**, **thrush**, and other health problems.

Horses can get **worms** when they eat near manure.

Insects like flies and mosquitoes breed in mud and manure. Insects can carry diseases such as **West Nile Virus** and can cause problems like conjunctivitis (also called pinkeye).

Mud and Horse Health

When horses are standing in mud for long periods of time it increases the chance of certain health problems. Some of these problems include:

- **Hoof Abscess** A hoof abscess is a pus pocket or an infection that occurs inside a horse's hoof. An abscess may result from puncture wounds, thrush, sole bruises, or laminitis. However, any openings in the sole or white line may allow bacteria to enter and form an abscess. Standing in mud for long periods of time can increase a horse's chance of getting an abscess. When horses stand in mud for a long time, their hooves can soften and crack. These cracks may be very thin, so thin that you can't even see them, but they provide a way for bacteria to get inside and cause an infection. An abscess can cause intense pain and severe lameness.

- **Mud Fever** (sometimes called Scratches) This is also an infection but it affects a horse's pasterns or fetlocks (lower leg). Living in mud can soften and damage the skin on a horse's lower leg. Once this happens, the organisms living in the mud may invade the damaged skin and cause an infection.

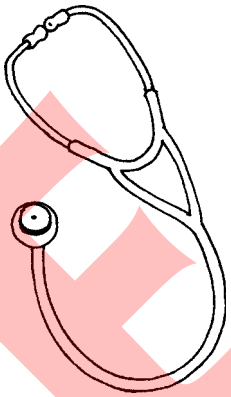
- **Thrush** This is an infection of the sole and frog of the hoof. The infection is usually black and is easy to diagnose because it causes the sole of the hoof to smell foul and rotten. Dirty conditions like wet bedding, manure, or mud provide an ideal environment for the fungi that cause thrush to grow. Thrush is usually caused by unclean conditions combined with long, untrimmed hooves.

- **Insects** Insects such as flies and mosquitoes thrive in muddy places. These insects are not only annoying, they can also carry diseases and sometimes cause allergic reactions in horses and humans.

- **Sand Colic** If horses are fed on muddy ground, they ingest dirt or sand particles. Because horses cannot digest sand and dirt, this can lead to a blockage in the intestine. This problem is called sand colic and can be very serious, sometimes even resulting in death.

Activity 1-1

Mud and Horse Health



Match the descriptions in the left column with the name of the health problem in the right column. Write the matching letter in the space provided.

__ 1 An infection of the sole and frog of the hoof. It is easy to diagnose because it causes the sole of the hoof to smell foul and rotten.

__ 2 A serious digestive problem that can happen when horses ingest dirt or sand particles.

__ 3 This infection can occur when horses stand in mud for long periods of time and their hooves soften and crack. Bacteria can enter these cracks and cause the infection.

__ 4 This infection affects the horse's lower leg. Living in mud can soften and damage the skin on the lower leg, allowing organisms to cause an infection.

__ 5 These creatures breed in muddy places. They can carry diseases and cause allergic reactions.

A Hoof Abscess

B Insects

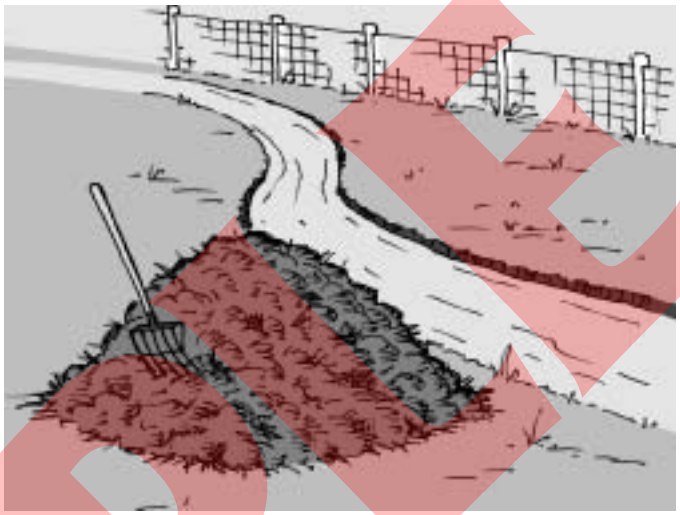
C Mud Fever

D Sand Colic

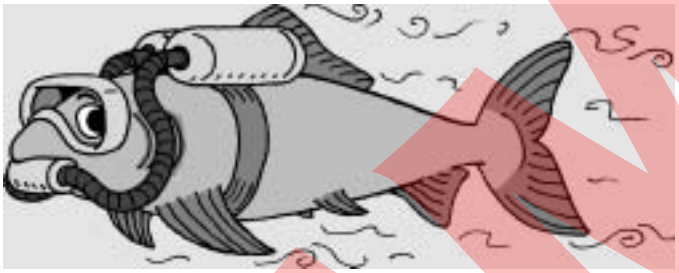
E Thrush

Why Healthy HorseKeeping Is Important for CLEAN WATER!

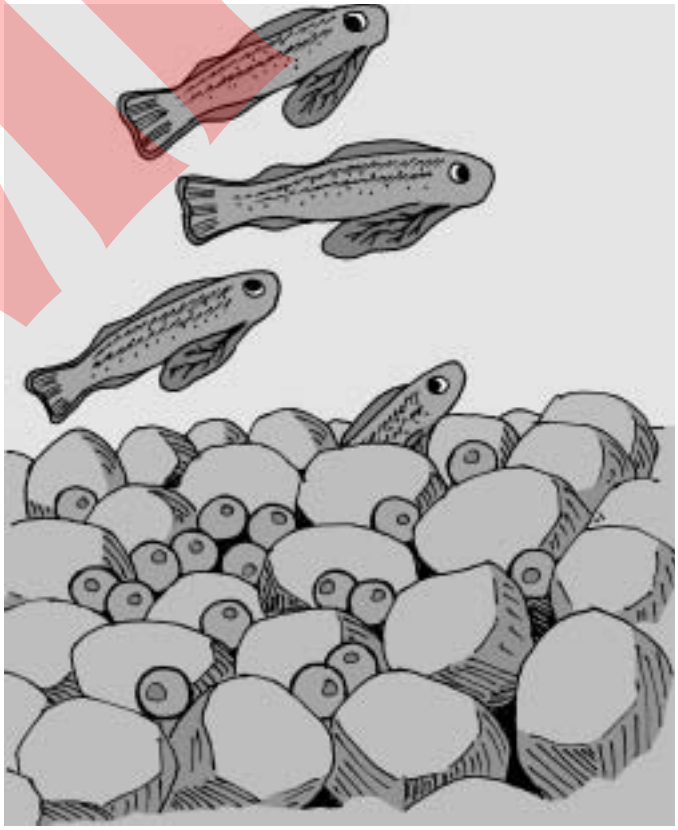
When horses aren't fenced out of streams, they can pollute the water and **harm fish**.



Manure piles too close to streams can lead to **water pollution**.



When nutrients from manure reach lakes they can cause algae to grow. Algae use up the **oxygen** in the water, making it difficult for fish to breathe.



Soil from overgrazed pastures can end up in streams and smother **fish eggs**.

Raindrops on the Move

When it rains, one of three things usually happens to a raindrop. Some raindrops soak into the ground. Some evaporate into the air. And some raindrops hit the ground and begin to travel—maybe down a street or through someone's yard or through a horse pasture.

From Clean to Contaminated

As rainwater flows along the ground it can mix with all sorts of things. Rainwater running along a street can mix with oil from cars. While traveling across a yard it might mix with fertilizer spread on the lawn. And rainwater running across a horse pasture can mix with manure or mud.

Rainwater will continue to flow along the ground until it reaches a body of water like a pond, stream, river, or lake. If this rainwater has mixed with things like oil, fertilizer, mud, or manure along the way, these pollutants can contaminate the water we drink and swim in. They can also harm the fish and wildlife that need clean water to survive.

Activity 1-2

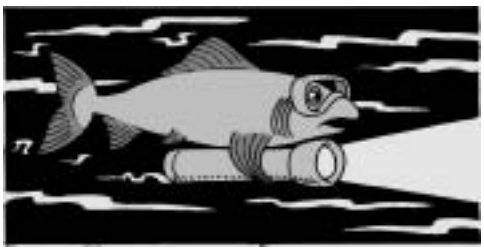
Pointing Out Pollutants

Can you think of four different pollutants that a raindrop might mix with before it reaches a stream? (Hint: read the previous paragraph for ideas.) List them below:

1 _____ 2 _____

3 _____ 4 _____

Clean Water Enemy: Mud



When rainwater travels across a pasture full of grass, it hardly picks up any of the soil that lies beneath the surface. Why? Because the **roots of the grass hold the soil in place**. But when rainwater travels across a pasture with bare spots that don't have any grass, the water will gather soil particles as it goes. Eventually, the rainwater will carry that soil to a body of water like a stream, river, or lake.

When soil ends up in the water where fish live, it can have serious consequences. Soil can make the water **cloudy** and hard to see through. This makes it hard for fish to see their food. Soil that ends up in the water can also **smother fish eggs**—cutting off the life of a whole generation of fish before it has even started!

Activity 1-3

Keeping Soil in Place

Look at the pictures above. If our goal in Healthy HorseKeeping is to keep soil out of streams, can you guess which pasture will hold the soil in place?

Is the answer A or B?

Why? _____

_____

_____

_____

Clean Water Enemy: Manure

Manure is full of **nutrients**, which is one of the reasons why many gardeners use manure in their gardens. Manure gives plants the nutrients they need to grow. However, while nutrients are great for growing fruits, vegetables, and flowers we don't want these nutrients in our water.

Weeds in Water?

When rainwater mixes with manure it becomes contaminated with nutrients. Once this contaminated rainwater ends up in a pond or a lake, the nutrients will cause plants in the water to grow. Unfortunately, we don't want plants to grow in the water like we want them to grow on land. Have you ever tried to swim in a lake full of algae? Not very fun, is it? **Algae** and other weeds that grow in the water aren't just bad for swimming, they can also harm fish because they **use up the oxygen** in the water that fish need to live.

Activity 1-4

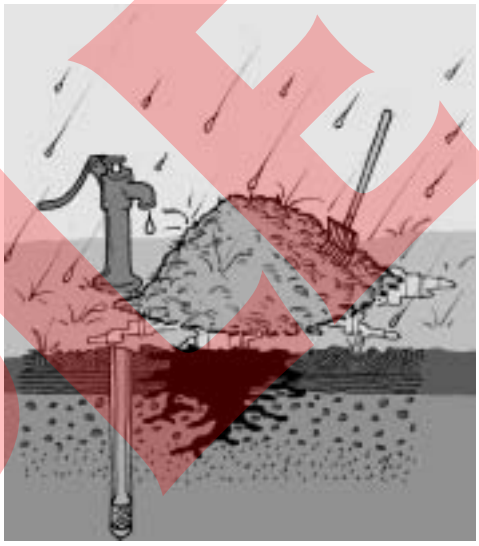
Manure in Water, Manure on Land

Fill in the blanks:

1. When you add manure to a garden, the _ _ _ _ _ _ _ _ _ in manure help plants to grow.
2. When nutrients end up in water, they can cause _ _ _ _ _ to grow.
3. Fish need _ _ _ _ _ _ in the water to survive.

Protecting Groundwater

Through the Ground and Into Your Cup



We also want to keep nutrients and bacteria out of our drinking water. Did you know that in many places there is water flowing underground where you can't see it? This underground water is called **groundwater**.

Many people use groundwater as their drinking water—in fact, half of the United States uses groundwater every day! How do people use water that is underground? That's what wells are for. **Wells** pump groundwater up to the surface and into your house.

When rain soaks into the ground, it can travel deep into the soil until it ends up in groundwater. If that rain has been contaminated, it can end up contaminating the groundwater. For example, if rain has mixed with manure before it soaks into the ground, it may be contaminated with **nutrients** and **bacteria**. As a result, the groundwater can become contaminated with nutrients and bacteria.

Activity 1-5

Know Your Source

Find out where your drinking water comes from. Does your water come from a well? Write your answer below.

Taking Action – What YOU Can Do!

Now that you know a little bit about the problems mud and manure can cause, let's start talking about solutions. What can you do to practice **Healthy HorseKeeping**? A lot! Let's conquer manure problems first.