Kendrick Watershed Plan
Project Update
Fall 2010

Natrona County Conservation District

Riparian Areas Reduce Selenium Migration

Looking out over the landscape of a watershed, it is easy to identify the viable creeks and streams by the presence of natural, lush vegetated corridors that line the banks of the waterway from the headwaters all the way to the point where it discharges into another waterway. This vegetated area, along with the associated waterway, is know as a riparian corridor. Healthy riparian corridors include an intact floodplain and well established, year-round vegetation. Although riparian corridors cover only a small portion of the land within a watershed, these ecosystems serve an important function.

In the Kendrick watershed, riparian area vegetation can reduce sediment containing selenium and other contaminates carried along by surface water runoff from entering a waterway. Roots and surface mulch in a riparian area remove selenium, nitrogen and other pollutants dissolved in ground water before it migrates to a waterway. The dense vegetation root system helps to stabilize creek banks and minimize soil erosion.

Riparian corridors and the associated floodplains act like a sponge to absorb irrigation and storm water runoff, and then slowly release the water over a period of time, keeping creeks flowing often until well into the dry season. Trees and shrubs in the riparian area reduce stream bank erosion during high water and flood events preventing excessive amounts of sediment-absorbed selenium and contaminants from entering the waterway.

While each creek, stream, and river has unique characteristics, all healthy waterways have the same fundamental components. In addition to a riparian corridor, there is a defined creek channel that periodically or continually contains flowing water and the creek bed composed of a mixture of gravel and sand with a limited amount of silt and sediment, free of trash and debris.

Healthy riparian areas create important wildlife habitats, providing dense vegetation and a high diversity of plant species. Long, connected riparian corridors allow wildlife to travel safely between habitats reducing the potential for over-grazing and excessive concentrations of single species populations. Riparian corridor trees and shrubs provide a canopy that shades and cools the water. Lower water temperatures encourage a diversity of aquatic life and decrease the potential for algae to form in the water.

Filter Strips & Selenium Management

Filter strips are generally man-made areas of herbaceous vegetation established between cropland, grazing land, forest land or disturbed land and environmentally sensitive areas such as drainages, channels, wetlands, waterways and other areas susceptible to damage by water-borne pollutants. Whether naturally occurring or man made, the vegetation growing in filter strips provides the same benefit as riparian area vegetation, functioning as a filter system to reduce sediment, particulate organics, sediment-adsorbed contaminants,

and dissolved contaminants from surface water runoff and ground water.

In the Kendrick watershed, filter strips can reduce sediment containing selenium and other contaminates from migrating to adjacent land with different uses, irrigation water sources and local waterways. Filter strips are generally established in areas where sediment, particulate organic matter and/or dissolved contaminants can naturally migrate, usually down-grade, to restricted land use areas or environmentally sensitive areas, such as the North Platte River.

Grazing in Riparian Areas

Like the rest of a farm or ranch operation, riparian areas must be managed to meet defined goals; for example, reducing concentrations of selenium in Kendrick watershed surface waters. In many areas of the country, farmers and ranchers are using managed grazing practices to improve pasture productivity, protect and maintain healthy riparian areas, and reduce pollutants entering surface and ground water.

There is no "cook book" solution to riparian grazing, rather a grazing management plan must be tailored to the unique characteristics of each riparian area with consideration of available resources, best use of those resources and a systematic monitoring program. Implementation of Best Management Practices (BMP) for grazing in a riparian area provide a planning framework for the development of a customized grazing management plan. Following are a few BMP guidelines for grazing in a riparian area:

- Manage the timing, frequency and intensity of livestock grazing within a riparian area.
- Avoid riparian area grazing during early summer and late fall to help avoid stream banks degradation.
- Consider seasonality and climatic conditions when grazing riparian areas to avoid damage to vegetation, stream banks, channels and bottom sediment.
- Limit access to riparian surface water sources especially during wet times of the year.
- Discourage livestock from congregating in or around surface waters; promote animal distribution through the placement of salt, alternative water sources, fencing, etc.

In some circumstances, livestock grazing can promote the natural regeneration of desirable vegetation and improve water quality in a riparian area. Grazing during periods of sprouting can increase the density of vegetation resulting in increased filtration of surface and ground water entering the creek, stream or river.

The effectiveness of any given riparian area grazing management plan depends on how well it fits both the ecological conditions of the grazing area and the management requirements of the farm or ranch operation. For more information or assistance in developing a customized riparian area grazing management plan, contact Natrona County Conservation District (NCCD) or the Natural Resources Conservation Service (NRCS).

The Casper-Alcova Irrigation District (CAID) encourages land owners to maintain healthy riparian areas and filter strips to reduce selenium migration. CAID has worked with landowners to improve water quality by lining the bottoms of irrigation water reservoirs and ponds to eliminate the migration of selenium from the bottom soil into the water. Pond and reservoir sizes have been reduced where practical to facilitate water quality management. Reducing the migration of selenium to local creeks, streams and the North Platte River through the creation and maintenance of filter strips and riparian corridors increases the amount of land available for productive use; and downstream, it provides improved water quality and reduces the cost of water treatment for downstream users.

Water Sampling Continues

In early 2003, NCCD initiated a comprehensive annual water sampling and analysis program in the Kendrick watershed to identify the concentrations and movement of selenium directly related to irrigation water conveyance systems and application practices. Over time the number of sampling sites has been reduced to focus attention on the areas of greatest concern. Currently, 17 sites in the Kendrick watershed are sampled bimonthly.

Kendrick Watershed Waterway	# Of Associated Sample Sites
Bates Creek	1
Garden Creek	1
Johnson Reservoir Drain	1
Lone Tree Gulch	1
Oregon Trail Drain	1
Six Miles Drain	1
Casper Creek	2
North Platte River	2
South Fork Casper Creek	2
Poison Spider Creek	5

Sean McGuire, InterTech Environmental & Engineering, is responsible for the bimonthly testing at each of the sites, most of which flow or contain water year round depending on annual precipitation. "This year was such an anomaly. The stream flow was very intense and the flow was high due to all the moisture we received," said McGuire.

Water samples from each sample site are laboratory tested for concentrations of selenium and field tested for acidity, dissolved oxygen and electrical conductivity. McGuire also calculates flow rate, measures channel width and photographs the sample sites to document the ever changing riparian areas, stream bank and channel conditions.

In January 2011, the 2010 sampling data will be analyzed and compared to previous data from the same sample sites to identify trends and changes in concentrations of selenium over the duration of the Kendrick area water sampling program. As the sampling data analysis becomes available, it will be included in this NCCD newsletter.

Kendrick Landowner Survey

A special thank you to the Kendrick Watershed landowners for their time to complete and return the recent NCCD survey. The information provided regarding your management of selenium in the soil, irrigation methods employed and topics of interest help us to develop future landowner information projects.

A summary of ***all*** survey responses is available through the NCCD office. Following are a few of the responses specifically related to selenium management and a profile of the landowners completing the survey.

Of those who responded:

- 49% indicated they are small acreage residents
- 33% indicated a combined farm/ranch operation
- 13% are farmers
- 5% are ranchers

Irrigation water delivery method used:

- 38% Flood
- 17% Center Pivot
- 17% Linear Side Roll
- 8% Low Energy Precision Application (LEPA)
- 6% Surge Valve Furrow
- 14% Other (includes K-line sprinklers, underground pipe, gated pipeline, etc.)

Respondents who have changed irrigation water delivery systems in the last five years:

- Yes, have changed - 38%
- No, have not changed - 62%

Question: Do you have selenium on your land?

- 49% Yes
- 34% No
- 17% Don't know

Thank you again for your time to complete this survey. For more information about any of the topics discussed in this newsletter, please contact:

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Fun & Games for Watershed Wonks

Wyoming County Game

Wyoming has 23 counties, can you name each one with the help of these clues?

1. 16th U.S. President
2. Bank robber
3. Brand of shoes
4. Brand of soup
5. Warm slinky
6. Capital of New York
7. Indian Chief
8. Western tribe of the Sioux
9. French for "broad, flat, shallow river"
10. Military general
11. Honey agua
12. Indian word for running H20
13. Indian word for "Pine Tree" or "Pine Forest"
14. Jacque's last name
15. Manufacturer of baby products
16. Non-metallic element
17. Pathfinder and Explorer
18. Rap talk for "no mineral"
19. Region where the Hebrews dwelt in Egypt
20. Rent your apartment to another party
21. Type of sheep
22. U.S. Photographer
23. Where you have a picnic

Source: State of Wyoming

*Answers to last issue's **Cloud Type** quiz: 1.D, 2.G, 3.H, 4.E, 5.B, 6.F, 7.A, 8.C.*

Egg in A Bottle - Wonk Style!

Like magic, you can put an egg inside a bottle! First, get permission to use the kitchen items and a hard boiled egg.

You'll need:

- One peeled hard boiled egg
- Plastic or glass bottle with an opening slightly smaller than the egg
- Large bowl of hot water
- Large bowl of ice water

Here's How:

1. Put the bottle in the bowl of hot water for about 5 minutes. **2.** Move the bottle to the bowl of ice water. Wet the egg and place it, point side down in the bottle opening. As the air inside the bottle cools, the egg will slowly move into the bottle. **3.** To remove the egg, hold the bottle upside down so the egg is lodged near the opening. Blow hard into the bottle with your mouth tight against the opening. Point the bottle away from you: *The egg flies out!*

Why It Happens?

Hot air expands, cold air contracts. When the air inside the bottle is heated, the molecules, or tiny air particles, inside the bottle spread out, increasing air pressure. As the air in the bottle cools, the air pressure decreases. The greater outside air pressure pushed the egg into the bottle. Blowing into the bottle raises the air pressure again causing the air and the egg to rush out of the bottle.

Water Facts

- The same water that existed on the earth millions of years ago is still present today; dinosaurs may have walked in the water you drank today.
- Water makes up almost 65% of the human body, and 70% of the brain.
- Water is the only substance found naturally in three forms: solid, liquid, and gas.
- Water dissolves more substances than any other liquid. Wherever it travels, water carries chemicals, minerals, and nutrients with it.

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