Water quality risk assessment for grazing areas

Tip Hudson, WSU Extension rangeland & livestock management regional specialist
• Reasons for water quality regulations
• Problems caused by livestock
• How does grazing affect water quality?
• How can I evaluate my own place/stream?
• Why should I care?
• What can I do?
Water quality regulations are intended to limit significant contributions of pollution to protect surface water.
Manure is not toxic waste, but excess sediment, nitrogen, phosphorus, and bacteria can cause serious problems.
Livestock grazing can affect water quality in two main ways:

1. Direct input of manure into surface water
Livestock grazing can affect water quality in two main ways:
2. Impairing vegetation and stream function so that it doesn’t filter low levels of potentially polluting substances
It is critical to maintain healthy upland conditions to protect water quality, because dysfunction on uplands affects stream conditions.
It is critical to maintain healthy riparian conditions to protect water quality, because good water quality is produced by healthy riparian vegetation.
Both sides of this fence are grazed.
SF Crooked River 1986 Spring Use
How can I tell if I have a problem?
WSU Extension water quality risk assessment

• WSU risk assessment is not a regulatory document
• The conditions and practices described should not be used as a new bright line, speed limit, sideboard . . .
• WQRA is designed to allow a producer to self-assess relative level of risk of water quality problems from an ecological perspective.
• Risky conditions & practices may not indicate a discharge or cause impairment, but do indicate higher risk
• Positive conditions & practices may not guarantee water quality compliance, but do decrease risk
Risky Conditions

Certain visual indicators or conditions are direct evidence of discharge and do not require further analysis:

• Contaminated runoff entering surface water
• A "plume" of sediment in the water where a streambank is being actively eroded by heavy livestock activity
• A “plume” of manure continually being washed into a stream
• Manure accumulation in or immediately adjacent to water (this is real potential)
Risky Conditions

Conditions within the stream zone which increase risk of a water quality problem include:

• Bare soil
• Visibly eroding streambanks; streambanks are more prone to erode when soils are saturated (Note: this is sometimes a hydrologic feature rather than livestock damage)
• Eroding livestock trails
• Replacement of riparian-type vegetation with upland-type vegetation and/or invasive plants
Duration and quantity matters – is there a significant contribution of pollutants to waters of the State? Be honest.
Why should I care?

1. Animal health – water consumption, pathogens, thermal stress
Why should I care?

2. Forage production is dramatically higher on healthy rangeland and riparian zones
<table>
<thead>
<tr>
<th></th>
<th>1978</th>
<th>1994</th>
<th>2010</th>
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<tbody>
<tr>
<td>Riparian Area</td>
<td>3.8 acres</td>
<td>12 acres</td>
<td>12 acres</td>
</tr>
<tr>
<td>Bank Erosion</td>
<td>12,448 feet</td>
<td>799 feet</td>
<td>&lt;100 feet</td>
</tr>
<tr>
<td>Water Storage</td>
<td>500,000 gal/mi</td>
<td>2,096,000 gal/mi</td>
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<tr>
<td>Production</td>
<td>200 lbs/acre</td>
<td>2000 lbs/acre</td>
<td>&gt;3,000 lbs/ac</td>
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<tr>
<td>Total production within</td>
<td>760</td>
<td>24,000</td>
<td>36,000</td>
</tr>
<tr>
<td>riparian zone</td>
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*Data from C. Rasmussen (1996) and W. Elmore*
What can I do? Talk to someone you trust.
What can I do?

Self-assessment
More good than bad – Dr. Sherman Swanson

**Good**

- Early
- Short duration
- Avoids hot season
- Rotate use areas and timing of grazing
- Light to moderate utilization
- long recovery periods
- Regrowth before winter
Good

- Occasional rest
- Stutter deferred (willows grow taller for two year, then a late graze year)
- More offsite water
- Well scattered salt/supplement
- Cleaned pasture, closed gates
Heavy spring utilization (April 30 photo)
But 60 days recovery allows full plant community expression (June 30 photo)
Bad

- Season-long
- Long season of use
- Hot season grazing in large pastures with limited riparian area
- Little water and only riparian water
- Heavy use too often
- Little or no regrowth before winter
Bad

- Graze at same time every year - repeated stress
- No rest - little recovery with multiple-season use
- Salting on creeks
- No riding/herding
- Stragglers stay in riparian zone
UI Policy Analysis Group conclusions

• If a site is grazed more than once per growing season, moisture conditions must allow regrowth

• Create separate, homogenous riparian grazing units (RIPARIAN PASTURE)

• Prevent cattle from congregating near surface water to protect streambanks
UI Policy Analysis Group conclusions

- Locate salt blocks, fencelines, and winter feeding areas away from surface water to prevent manure accumulation adjacent to water
- Avoid utilization levels >65% to sustain vegetation & 3-6” residual height
- Vegetative buffers (ungrazed) not necessary unless:
  - Animal ccn reduces ground cover to <50%
  - Trampling damage causes sloughing
  - Large amounts of manure are deposited in one place
WSU Kittitas County Extension overview

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