



SECTION 9

Pasture and Riparian Management

Over the past several years there has been a migration from city residential single family living to homes on small acreages. This section will address conservation and pollution prevention measures which can be implemented to protect pastures and riparian areas up to twenty acres in size. The need for this type of information has been clearly demonstrated in watersheds throughout the state.

Most owners of these small farms are concerned about what they can do to help with the restoration of the watershed. Improper grazing of pasture and riparian areas on small farms can lead to pollutants such as sediment, nutrients, and bacteria entering streams. Individually their contribution may seem small, but as the numbers of small farms increase, the potential for more pollutant input on a watershed scale increases. This section will provide the information these landowners should consider to become a part of the solution to improve water quality.

Pastures

Pastures in good condition provide adequate protection from erosion by wind or water. Proper grazing systems help to prevent erosion and sediment and nutrients delivery from pasturelands. Soil compaction and increases in water runoff can occur when pastures are grazed when wet. This can occur on pasturelands used as winter and spring feeding areas, on pastures grazed in early spring while soils are still wet, and on pastures grazed during or too soon after irrigation. Overgrazing can leave pastures vulnerable to erosion by water and lead to excessive nutrient leaching or runoff.

For a successful grazing program, the following management tips should be considered:

- Eliminate continuous season-long grazing; allow 30 day rest periods or use a high-intensity, short duration grazing system to rejuvenate poor condition pasture.

- Subdivide large pastures into smaller ones and develop and maintain a pasture-rotation system.
- Corral livestock and feed them hay until your pasture grasses are 6" to 8" high. Move livestock when 50% of the grass plant has been eaten (3" to 4" height remains). Do not regraze until grasses are at least 6" high (will take up one month).
- During winter months, continue your rotation and feed in dry pastures to distribute manure and feed evenly across your pastures or hold animals in a corral.
- Horses do not need 24-hour access to feed or forage as nutritional needs can be met with only a few hours of grazing on good pasture each day. Corral animals for a period each day to prevent overgrazing of plants and extend usage of available forage.
- Provide a water source for each pasture.
- Irrigate each pasture (if irrigated) immediately after grazing to get plants growing again. Do not graze on wet soils.

What is a riparian area?

Riparian areas are areas adjacent to creeks, streams, wetlands, lakes and rivers where vegetation is strongly influenced by the presence of water. By influencing the timing and quality of water delivered to water bodies, the condition of riparian areas can have significant economic and environmental consequences.

Riparian vegetation filters out sediment which builds streambanks, forms productive wet meadows and floodplains, and reduces sedimentation of reservoirs. Riparian areas in good condition slowly release water to stream channels, thus improving seasonal water quantity and quality. They also stabilize the water table as well as water to be recharged, and assist in the beneficial recycling process of accumulated nutrients.

How does grazing relate to riparian areas?

Management of animal grazing on riparian areas for small plots of land should follow the same basic strategy as that for larger plots of public or private land. Improper animal grazing can affect the amount, timing, and quality of water in riparian areas. Improper animal grazing effects on riparian areas include loss or reduction of streamside vegetation and trampling of streambanks and channels. Channel stability is reduced and becomes more susceptible to erosion by high flows. Stream downcutting or channelization of riparian areas will result in additional erosion and lowering of the water table. Streambank compaction can also occur and contribute to poor plant root development and decreasing the soil's infiltration rate. Improper grazing can eliminate woody vegetation which would result in decreased shade and a potential increase in stream temperatures. Streams will become wide and shallow, resulting in elevated water temperatures and will have a negative effect on cold water insects and fish.

Degraded Riparian Areas

- Little vegetation to protect and stabilize stream banks and provide shade
- Lowered water table and saturated zone, reduced subsurface water storage
- Reduction or elimination of summer stream flows
- Warmer water in summer and increased icing in winter
- Poor habitat for wildlife, fish and other aquatic organisms

Healthy Riparian Areas

- Diverse vegetation and root systems protect and stabilize stream banks; stream shaded
- Elevated water table and saturated zone increased subsurface water storage
- Increased summer stream flows
- Cooler water in summer, reduced icing in winter
- Good habitat for wildlife, fish and other aquatic organisms
- Increased potential for nutrient recycling

Potential ground-water impacts

Poor grazing management practices often lead to slower soil infiltration rates. Decreased plant cover leaves more soil exposed to raindrop impact and soil compaction, further reducing infiltration rates. A slower infiltration rate means that more water will run off and less water will be available for plant growth, subsurface percolation, and groundwater recharge.

The potential impact on the quantity and quality of deep groundwater aquifers is low. However, grazing can impact the quality, amount, and timing of shallow ground water. In many cases, the flow of perennial and intermittent springs and streams is sustained by shallow ground-water flow. Again, poor grazing management practices can alter the amount of shallow ground-water flow and impact water quality. Decreased soil infiltration will cause increased overland and ground-water flow and can also cause a shift in plant species and increased evapotranspiration.

Potential surface water impacts

Most research indicates that impacts to surface water from poor grazing management practices can occur in the form of increased bacteria and nutrient concentrations and increased sediment production in the downstream portion of the watershed. It appears that coliform bacteria in streams are a function of animal density and their direct access to streams. When high bacteria levels occur, they have been found to return to acceptable levels within several stream miles.

Of the nutrients that could impact streams, nitrogen and phosphorus are of the most concern. Phosphorus binds to soil organic and mineral particles and is a potential pollutant any time soil erosion rates are high. On pastures receiving fertilizer there is the potential for nutrient loss to streams, especially in areas with poor drainage, poor grazing management, or soils that have a high leaching potential.

Riparian grazing potential solutions

Best: Use fencing to exclude livestock from the riparian area. Livestock exclusion allows riparian plants the greatest opportunity for recovery in the shortest period of time. Significant improvement is often seen in only two to three growing seasons. Use watering troughs away from surface water wherever possible.

Good: If riparian grazing is necessary, use fencing to allow *controlled* grazing of the riparian area. Avoid grazing the riparian area until streambanks are stable and well vegetated, then graze only in the late spring for short periods. Avoid early spring grazing because streambanks are saturated and vulnerable to trampling. Avoid summer and fall grazing because this is when livestock tend to overgraze shrubs, especially willows. In just a few days, livestock can remove an entire year's shrub growth. Avoid grazing riparian plants shorter than three inches.

Best management practices

Best Management Practices (BMP's) are practices or combinations of practices found to be the most effective and practical means of preventing or reducing the amount of pollution generated by nonpoint sources. For a BMP to be practical, it must be; technically feasible, economically feasible, and socially acceptable.

Best Management Practices that could be useful to the small farm type operation for grazing of both pasture and riparian areas are:

- **Fencing** is the enclosing or dividing of an area of land with suitable permanent structures that act as a barrier to animals, wildlife, or people. Rotational grazing can be used with properly fenced pastures. Temporary fencing can enhance grazing systems.
- **Livestock exclusion** is the exclusion of animals from an area not intended for grazing. Fencing is an excellent way to exclude animals from riparian areas. The width of area fenced should be carefully planned.
- **Nutrient management** is managing the amount, form, placement, and timing of applications of plant nutrients. Performed properly, nutrient inputs to streams from fertilizer applications can be substantially reduced.
- **Pasture management** is the proper treatment and use of pasture. Planning and maintaining the proper use and fertilization, minimum forage height and pest control of pastures helps focus other practices towards water quality goals.
- **Planned grazing system** is a practice where two or more grazing units are alternately grazed. This could be useful where separation of pastures will continue to improve forage.
- **Ponds.** Embankment or excavated ponds may be used to water animals. Small constructed ponds are valuable as sources of water when stream access is prevented to provide riparian area protection.

- **Proper grazing** is using correct timing, duration, and animal numbers that will maintain enough cover to protect soil and maintain or improve vegetation quality and quantity. This can be used in conjunction with a planned grazing system.

- **Water development** is improving springs and seeps by excavating, cleaning, capping, or providing collection and storage facilities. Also includes wells and pipelines in order to place water where desired. When springs are located on the property, they can become an excellent source of stock water. This can be part of a riparian protection plan.

- **Critical area planting** is planting vegetation, such as trees, shrubs, vines and grasses or legumes on erodible areas. This practice is an excellent way to reduce sediment runoff from any problem area. It should be used with other measures, such as, animal exclusion or rest.

- **Ephemeral watercourse planting** is using adapted plant species and double seeding techniques to reduce the formation of ephemeral gullies. When used in combination with mulching and small rock structures, this can be very effective at reducing erosion.

- **Fish stream improvement** is improving a stream to create new fish habitat or enhance existing habitat. This practice will require a stream alteration permit from the U.S.Army Corps of Engineers and other appropriate agencies. When used in conjunction with other riparian area protection methods, a small farm can have both grazing and a healthy riparian area with an improved instream fishery.

- **Heavy use area protection** is protecting heavily used areas by establishing plant cover, surfacing, or structures. This is an excellent way to prevent erosion from high traffic areas..

- **Streambank and shoreline protection** is using vegetation or structures to stabilize and protect banks of streams against scour and erosion (may require a stream channel alteration permit). When suitable riparian protection is initiated, streambank improvements are very effective.

- **Wetland development and restoration.** The construction or restoration of a wetland facility to provide the hydrological and biological benefits of a wetland. Establishing or improving wetlands is an excellent way to improve riparian areas and raise water tables to be utilized by forage plants.

- **Salting.** Salt blocks are useful for controlling animal distribution. Placing salt away from watering locations will help reduce time spent near water.

Summary

Utilizing proper grazing management strategies and improving pasture and riparian areas is beneficial to the landowner as well as water quality, fish and wildlife. Virtually all of the practices mentioned above result in some type of improvement in forage or water table levels which translates into improved productivity over the long term. Small farm owners concerned with water quality as well as increased productivity should seek the proper technical assistance for the implementation of a plan to improve forage production, riparian areas, and animal watering capabilities. Proper management of both pasture and riparian areas can benefit your property in the following ways:

- Create diverse vegetation and root systems which protect and stabilize streambanks and lessens the likelihood of flooding.
- Maintain water table and saturated zone and increases subsurface water storage which promotes deep root growth and lessens the threat of invasive weed species.
- Reduce stream channel icing in winter and insulates and shades water in summer heat.
- Increase quantity and quality of animal forage.
- Reduce soil erosion and off-site sediment delivery.
- Reduce the risk of both surface and ground-water contamination.
- Improve aesthetic value and related property values

Notes:



Pasture and Riparian Management

Homeowner Risk Assessment Sheet

WORKSHEET 9

ASSESSMENT 1 – *Pasture and Riparian Management*– The assessment table below will help you identify potential environmental risks related to Lake Pend Oreille and the way you manage your pasture. For each question indicate your risk level in the right-hand column. Some choices may not correspond exactly to your situation. Choose the response that best fits. When finished turn to the **Action Checklist** on page 4 and record your medium and high-risk practices. Your goal is to lower your risks. Use the BMP recommendations in Section 9, Pasture and Riparian Management to help you decide how to best reduce pollution.

	LOW RISK	MEDIUM RISK	HIGH RISK	YOUR RISK
Streambank condition	More than 90% of the streambanks are stable with plant cover or large rocks. Little or no active erosion.	70-90% of the streambanks are stable with plant cover or large rocks. Some active erosion.	Less than 70% of the streambanks are stable with plant cover or large rocks. Active erosion very evident.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
Livestock access to stream	Stream fenced to exclude livestock.	Limited livestock access to stream.	Unlimited livestock access to stream.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
Streamside (riparian) vegetation	Stream well shaded with trees and/or shrubs. Perennial plants dominate with few or no annual plants.	Trees and/or shrubs providing some shade. Perennial plants dominate with some annual plants.	Little or no shade provided by trees and/or shrubs. Perennial or annual plants may dominate.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High

ASSESSMENT 1 CONTINUED – *Pasture and Riparian Management* – Use the table below to rate your risks related to managing your pasture.

	LOW RISK	MEDIUM RISK	HIGH RISK	YOUR RISK
Streamside (riparian) vegetation trend	Streamside tree and/or shrub seedlings present and growing well	Streamside tree and/or shrub seedlings present but not growing well.	Streamside tree and/or shrub seedlings not present.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
Grazing management	Two or more pastures used in rotation to allow plant rest. Grazing period begins at a 6" leaf length and ends at 3". Plant height at least 3" going into winter.	Two or more pastures used in rotation to allow plant rest but grazing period begins at less than a 6" leaf length and/or plants grazed shorter than 3". Plant height less than 3" going into winter.	Pasture(s) not allowed rest. Grazing period begins at less than a 6" leaf length and/or plants grazed shorter than 3". Plant height less than 3" going into winter.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
Plant health	Forage plants are healthy with dark green leaves, deep roots, and vigorous regrowth. Very few weeds. High production.	Forage plants somewhat unhealthy. Plant production beginning to decrease. Weeds increasing.	Forage plants are unhealthy and may have yellowish colored leaves, shallow roots, small size, or slow regrowth. Weeds common. Low production.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
Heavy use area(s) (corrals, troughs, or salt areas with little or no protective plant cover)	Heavy use area(s) established well away from stream or irrigation ditch.	Heavy use area(s) near stream or irrigation ditch and runoff is not diverted or captured.	Heavy use area(s) located adjacent to stream or irrigation ditch.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High

ASSESSMENT 2 – *Pasture and Riparian Management* – Use the table below to rate your risks relating to riparian health. When finished turn to the **Action Checklist** on page 4 and record your medium and high-risk practices.

	LOW RISK	MEDIUM RISK	HIGH RISK	YOUR RISK
Irrigation (complete only if irrigated)	Sprinkler irrigated with little runoff, OR surface irrigated with no stream in or adjacent to pasture, OR surface irrigated with tailwater captured.	Surface irrigated with 20' wide or greater buffer of ungrazed vegetation along the stream	Surface irrigated with no buffer along the stream; tailwater is not captured.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High
Fertilizers	Fertilizers applied based on soil test or Extension guidelines and manure scattered with harrow, OR fertilizer not used and manure scattered.	Fertilizer applied without soil test or Extension guidelines, but manure is scattered.	Fertilizer applied without soil test or extension guidelines and manure is not scattered.	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High

