Stepping Back from the Water Implementation

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What is *Stepping Back?*

- Released in 2012 by the Government of Alberta

- A handbook designed to guide and assist municipalities, watershed groups, developers and landowners in Alberta's settled region in determining appropriate setbacks and management practices for developing near water bodies

  - Minimizes impacts and risks associated with new development by allowing these groups to:

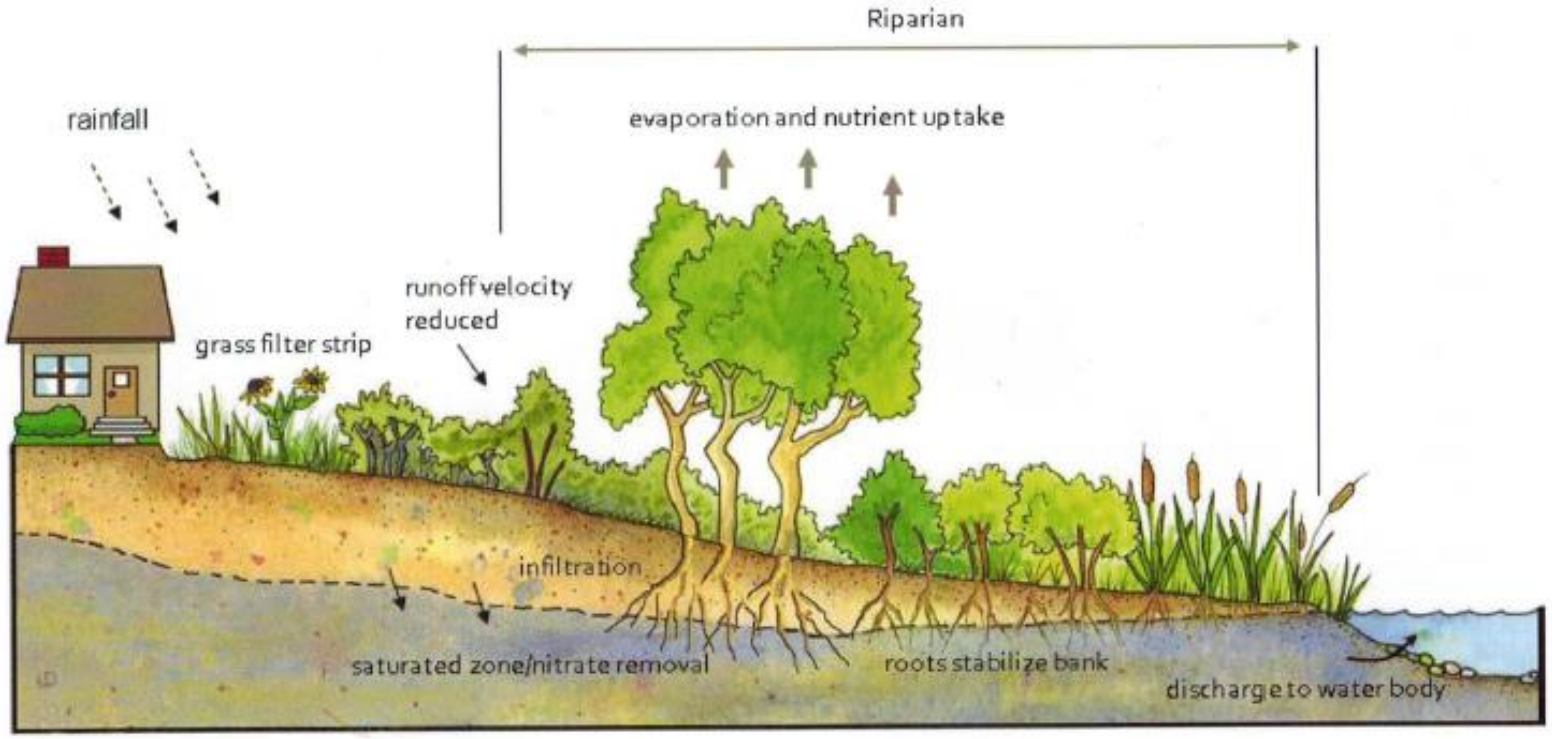
    - Identify riparian lands and understand their function
    - Understand how setbacks can be applied to create effective riparian buffers
    - Conserve and manage riparian land
    - Manage erosion and pollutants

Introduction

- Riparian areas are transition zones between land and water
  - Healthy riparian areas provide broad benefits (environmental, social, and economic)
  - Unique challenges in management
- Riparian Management is a shared responsibility
  - Best tools fit local environmental, social, and economic conditions
- What is the purpose of Stepping Back From the Water?
  - Education on the nature and function of riparian areas
  - Determining building setback widths and designing effective buffers
  - Only for new development adjacent to water bodies
  - To present BMP recommendations and tools for managing riparian areas

Riparian Areas

Figure 1
Illustration Showing a Riparian Area and Some of Its Interactions with Water



Why?

- Activities and disturbances impact riparian areas!
  - Erosion and sedimentation
  - Flooding
  - Slope failure
  - Surface and groundwater pollution
  - Loss of fish and wildlife habitat
- Stepping Back can help ensure adequate setbacks and erosion and pollutant management

How?

- Determination of filter strip width, unstable ground, erosion-prone areas, and flood plain
- Checklist:
  1. Define scenario
  2. Summarize key information
  3. Floodplain mapping
  4. Determine width of VFS
  5. Determine setbacks relative to site constraints
  6. Additional considerations

Recommended Data

Waterbody Classification

- Permanent body of water vs. ephemeral/intermittent streams vs. non-permanent wetlands
- Different classes of water bodies have broadly different functions and requirements for protection

Recommended Data

Flood Water Conveyance and Storage

- Floodplains (Rivers and Streams)
  - Floodway and flood fringe; 1:100 year floodplain
- Flood Levels (Lakes)
  - 1:100 year level

Recommended Data

Water Quality Functions

- Topography and Slope
  - From legal bank to adjacent uplands
- Parent Material
  - Glacial till or water/wind deposited
- Groundwater
  - Surficial or alluvial aquifers
  - Shallow groundwater (<1.8m)
  - Springs and seeps

Recommended Data

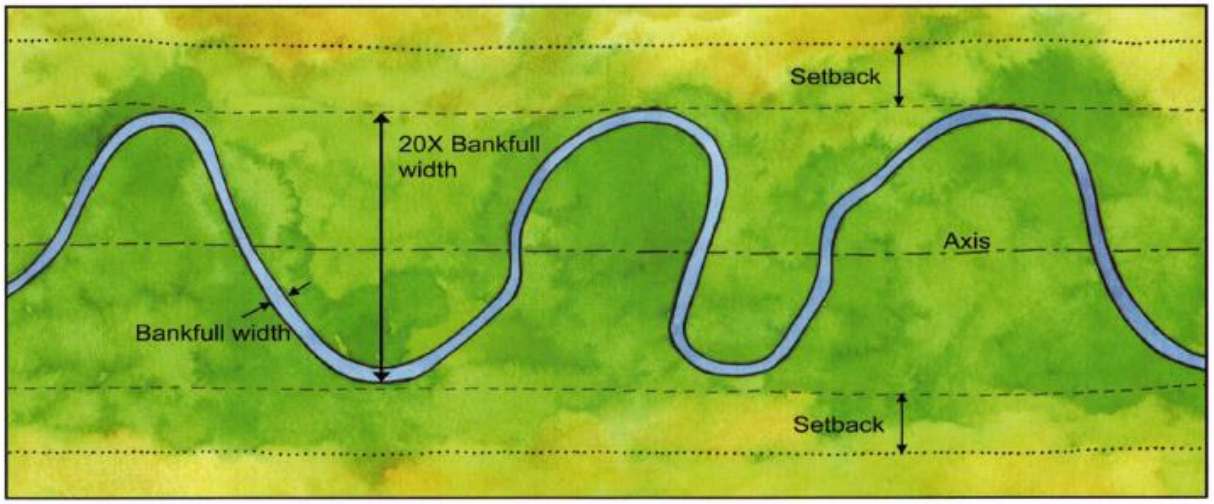
Bank/Shoreline Stability

- Erosion Prone Lands/Undercut Banks
  - Highly erodible soils and areas of channel migration
- Sloping Ground
  - Slopes >25%
- Unstable Ground
  - Steep bank edges, near seeps/springs

Recommended Data

- Active channels
  - Use width of meander belt
  - Setbacks measured from edge of meander belt
- Fish bearing channels
  - Minimum 30m buffer

Figure 2
Schematic Diagram of a Meander Belt



Recommended Data (additional considerations)

Habitat and Biodiversity

- Environmentally Significant Areas (ESAs)
  - May include riparian areas of major rivers
- Wildlife Sensitivity Maps
  - Migration corridors, summer/winter ranges, nesting or birthing sites, species at risk ranges, sensitive amphibian ranges

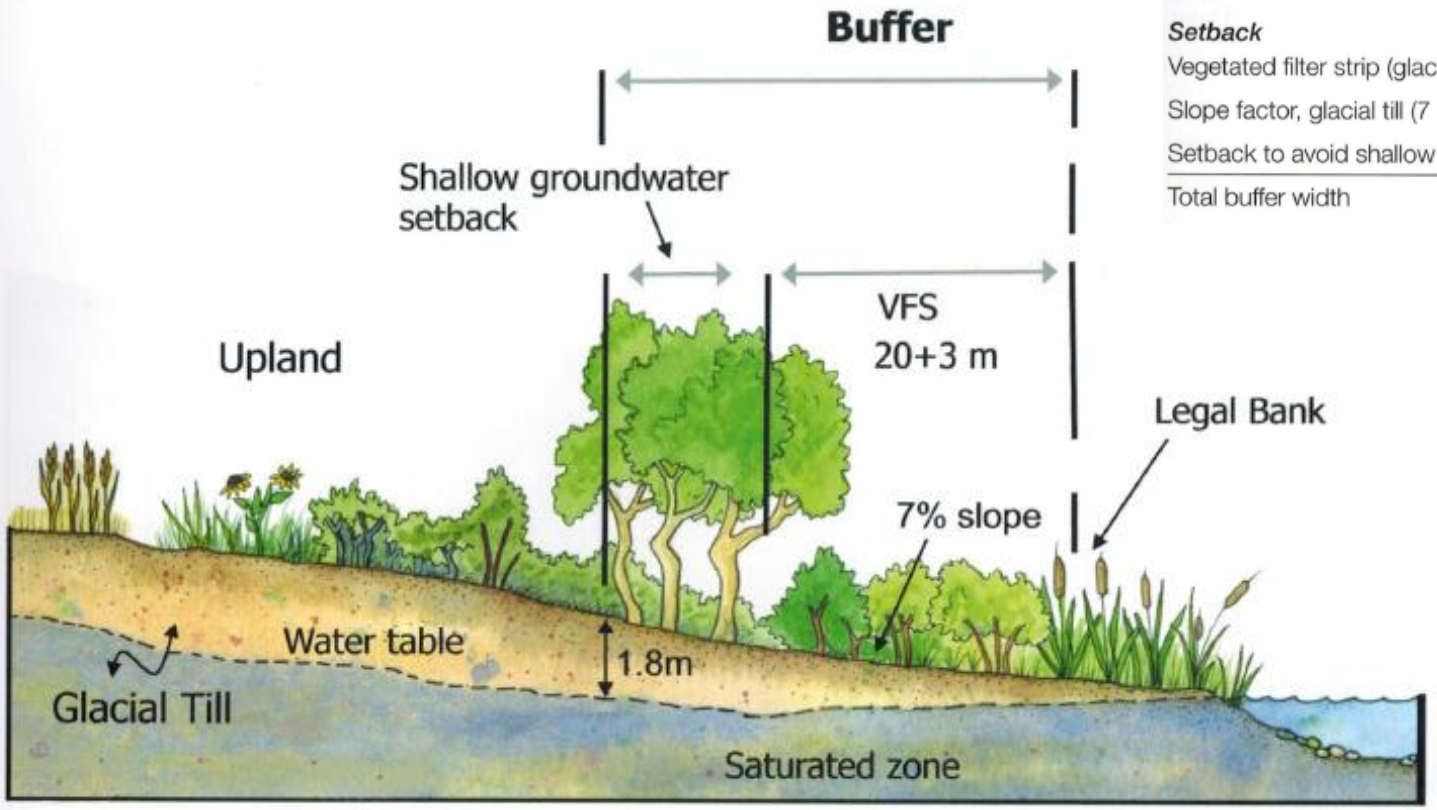
Recommended Data (additional considerations)

Habitat/Biodiversity

- Rare Species
  - Species at risk that use riparian areas (N. leopard frog, peregrine falcon, prairie falcon, bald eagle, great blue heron, etc.)
- Vegetation
  - Cover type and composition (discussed but not addressed directly by original document)

Examples

Figure 3
A lake or wetland buffer on glacial till, comprised of a vegetated filter strip (VFS), and setback for shallow groundwater.

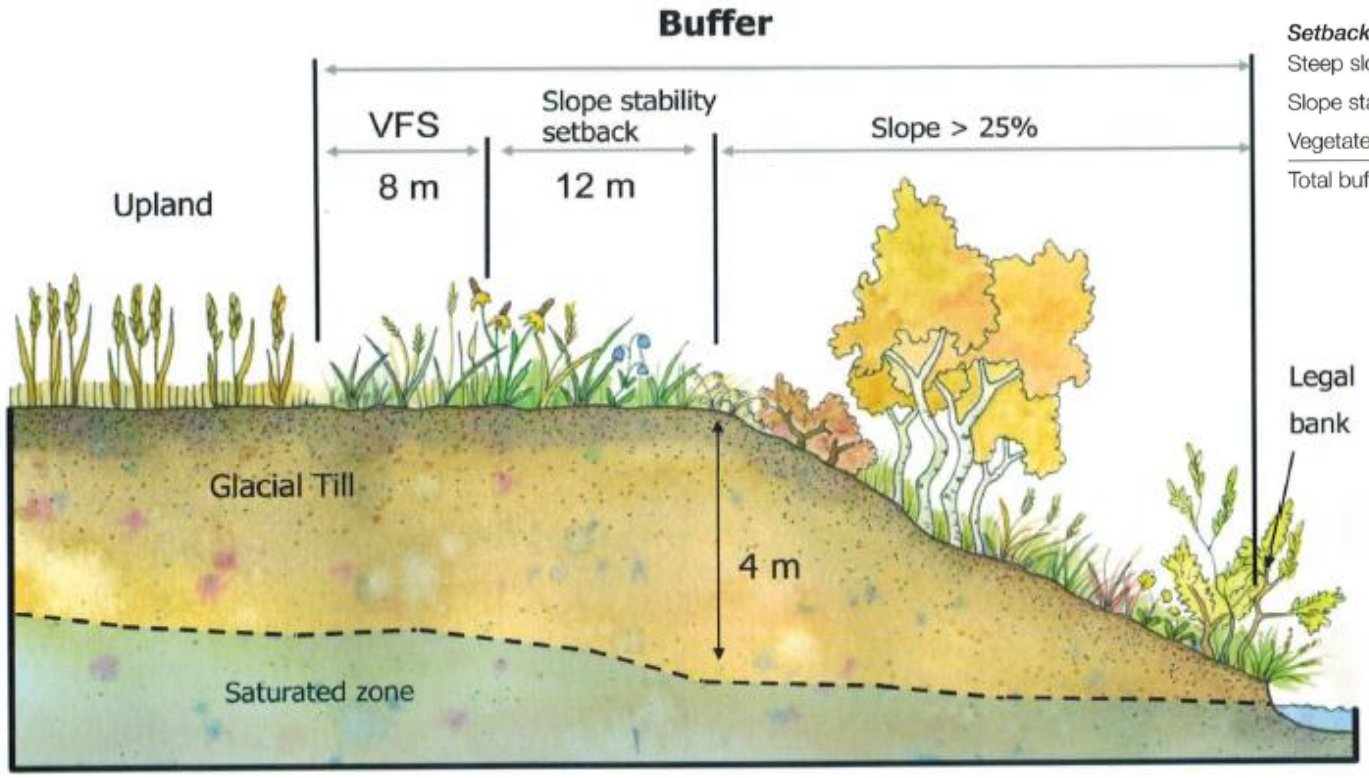


Buffer width calculation for Figure 3

Setback	*Width (metres)*
Vegetated filter strip (glacial till)	20
Slope factor, glacial till (7 - 5) x 1.5	3
Setback to avoid shallow groundwater[13]	10
Total buffer width	33

Examples

Figure 4
A stream buffer on glacial till, comprised of a steep slope, slope stability setback, and a vegetated filter strip. The steep slope does not count toward the vegetated filter strip.

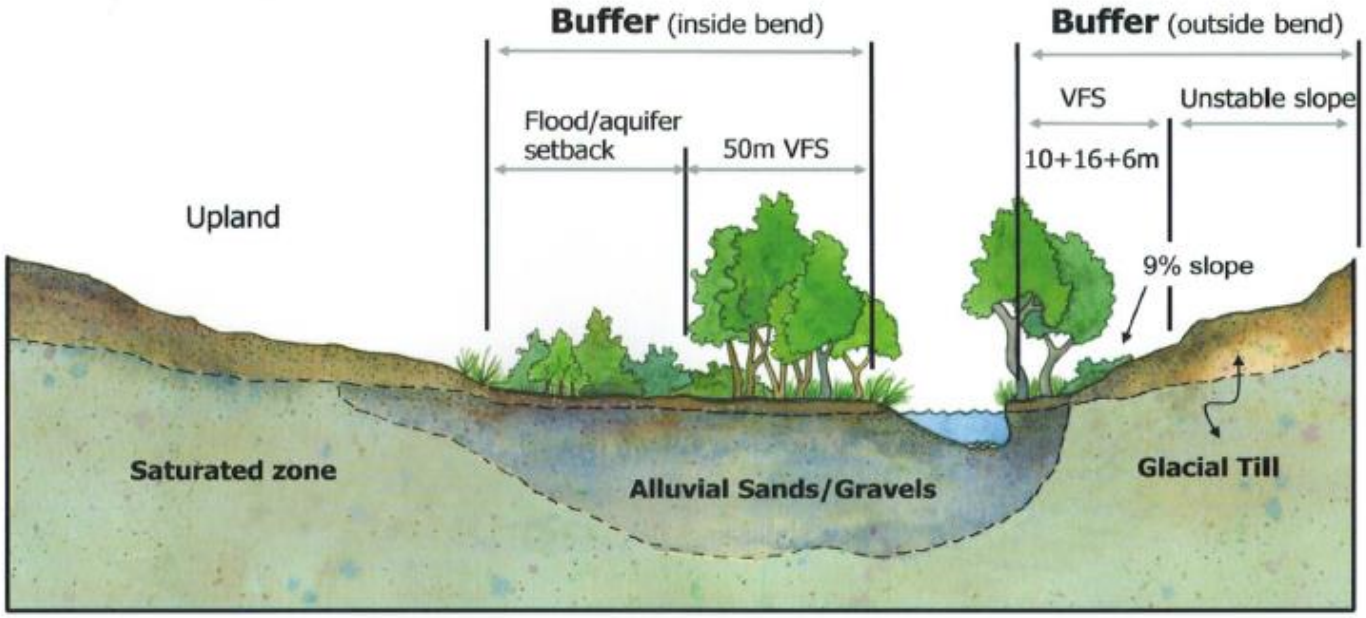


Buffer width calculation for Figure 4

Setback	*Width (metres)*
Steep slope > 25%	16
Slope stability setback[14]	12
Vegetated filter strip	8
Total buffer width	36

Examples

Figure 5
River buffers on glacial till and alluvial sands/gravels, comprised of vegetated filter strips, a flood/aquifer setback, and a slope stability setback.



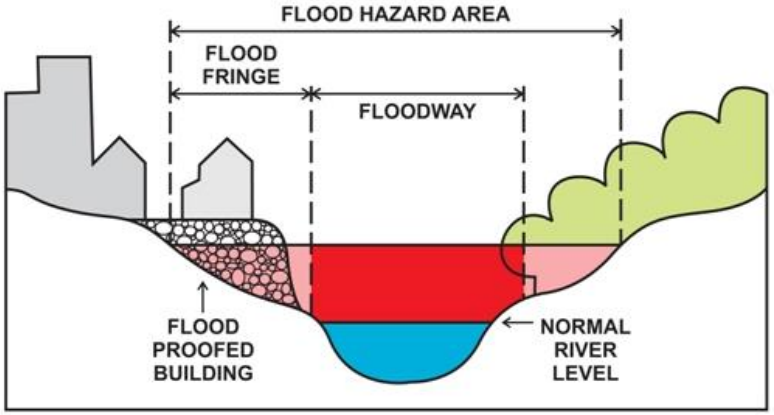
Buffer width calculation for Figure 5

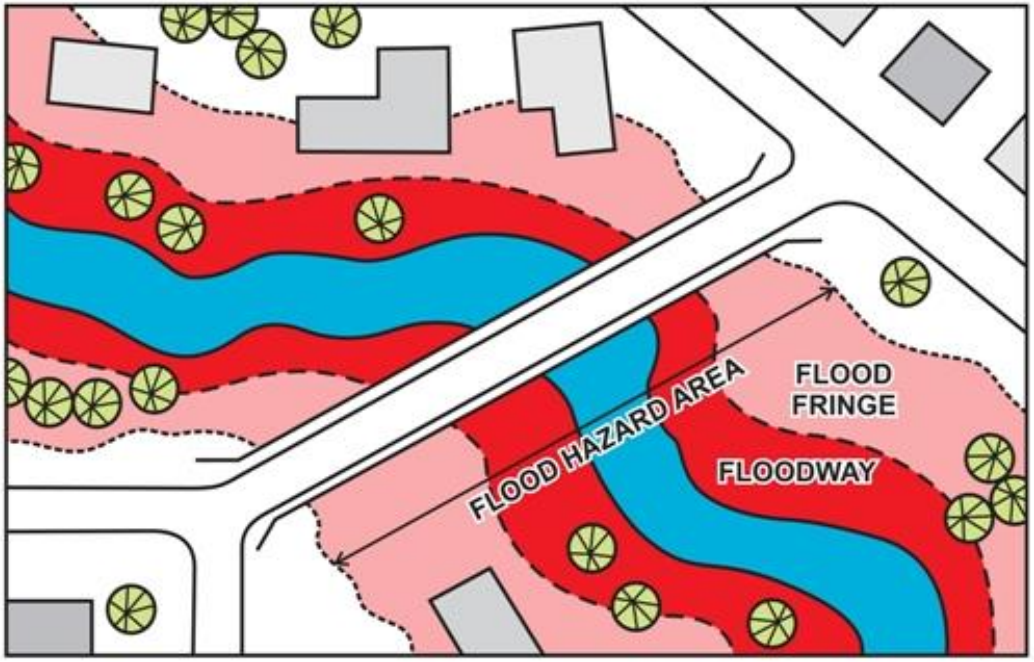
Setback (Inside Bend)	*Width (metres)*
Vegetated filter strip (alluvium)	50
Flood/aquifer setback (site dependent)	50
Total buffer width	100

Setback (Outside Bend)	*Width (metres)*
Vegetated filter strip (alluvium)	10
Vegetated filter strip (glacial till, Table 4)	16
Slope factor, glacial till (9% – 5%) x 1.5	6
Unstable slope setback (site dependent)	20
Total buffer width	52

Examples

- Important in urban areas too!





Issues with implementation

- The original document takes a narrative approach rather than workflow to determining setbacks
- Some implementation details are not clear from text
  - Can largely be reverse engineered from text and examples, though some details are open to interpretation
- Examples don't provide full range of scenarios for exploring potential setback requirements

Updates from current project

- Development of toolkit including workflow documents detailing approach
  - Detailed implementation, but somewhat unwieldy for quick assessments
  - Explanations of requirements for end-users to improve familiarity with approach
- Web application
  - Minimal implementation
  - Good for determining setbacks when parameters and model implementation are already well understood by user

Web Application

- http://webapps.aquality.ca/apps/steppingback/
- Application takes user input to determine recommended setback for site
- Does not account for e.g. environmentally significant areas or rare/sensitive species
  - Requires site-by-site determination based on expert knowledge
  - May not require changes to setbacks but rather

Conclusions

- Riparian areas are important!
- Stepping Back from the Water provides guidelines on determining appropriate setbacks
- Help to balance environmental, social, and economic pressures
- Current project focuses on increasing utility and approachability to improve rate of implementation