

**1.1 Analysis of stream fencing needs for the Falling River TMDL
Implementation Plan**

1.1.1 Data used for analysis

GIS data was used to estimate fencing needs for the Falling River watershed. High-resolution data from the USGS was used in calculating stream lengths by determining the length of stream that passed through land classified as pasture/hay.

1.1.2 Results: Fencing needs

The total fencing needs are summarized in Table 1. The GIS analysis was implemented to distinguish between stream segments that would likely be fenced on one side only (e.g. stream running along the edge of a pasture) versus on both sides (e.g. stream in the middle of a pasture). In an effort to identify the areas where fencing may have the most benefit a targeting procedure was used. Targeting of critical areas for livestock fencing was accomplished through analysis of land use and stream network GIS layers. For each sub-watershed the fencing requirements were determined. The sub-watersheds were then ranked in descending order based on the fence length. The sub-watersheds ranked by this method are shown in Figure 1. The darkest sub-watersheds are the highest ranked and the lightest are the lowest ranked in the targeting figures.

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Table 1 Total perennial stream fencing estimates by Falling River sub-watershed.

Sub-Watershed	Adjoining Pasture/Hay (Feet)
1	17,344
2	73,485
3	3,147
4	9,993
5	35,083
6	35,488
7	28,760
8	5,159
9	9,458
10	80,188
11	10,086
12	116,456
13	38,318
14	6,027
15	96,097
16	19,185
17	13,045
18	10,161
19	48,199
20	4,899
Total	660,577
Fence installed from 1/1990 - 12/2000	5,898
Fence installed from 1/2001 - Present	30,571
Net Fence Required	624,109

Falling River Streamside Fence Targeting

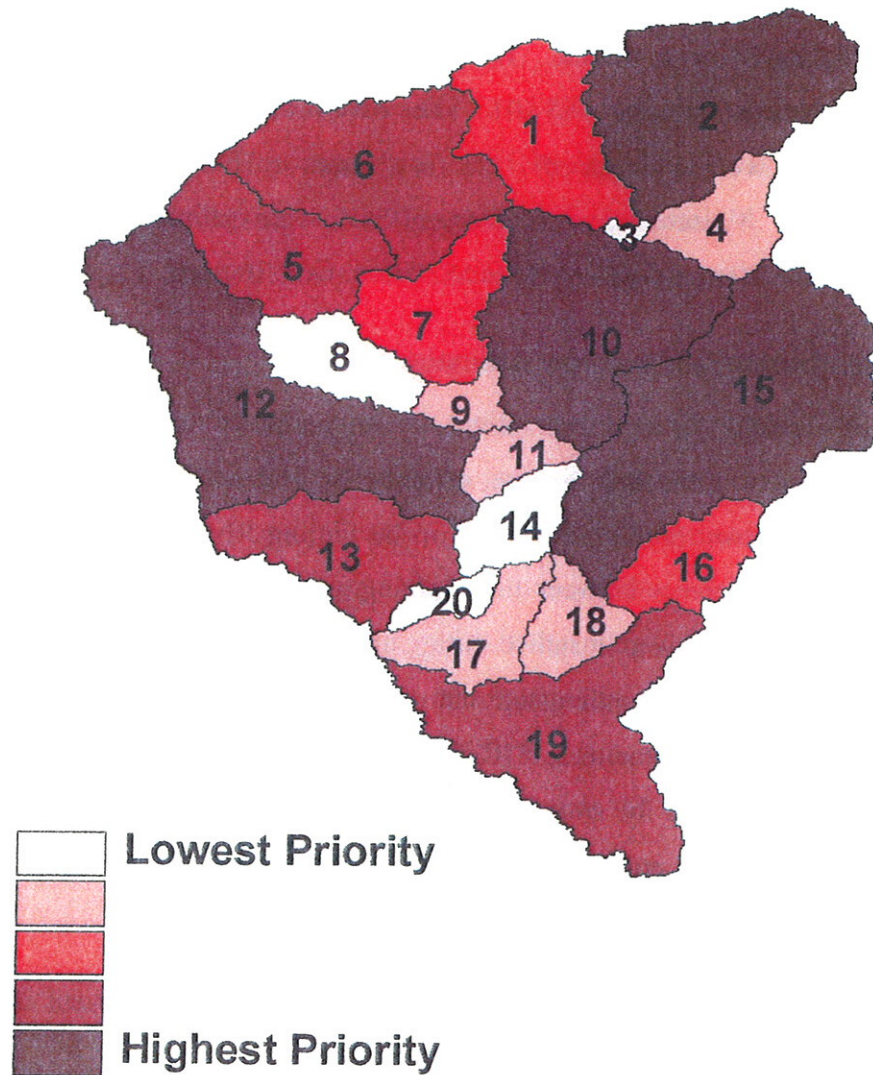


Figure 1 Falling River sub-watersheds ranked by stream fence implementation priority.

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1.1.3 Determining fencing and maintenance costs

Agricultural Best Management Practice (BMP) data (DCR VA Ag Cost Share Database) through 2006 from the Falling River watershed are used as an indicator of cost and expected practice implementation for the Falling River impairment. There were 31 SL-6 systems in the Falling River watershed. Of these, the average stream fencing length was 866 feet with an average total cost of \$7,015. The cost of a WP-2T system was estimated to be \$2,976 and an average length of 1,925 feet based on five practices found in the DCR BMP database. Maintenance or replacement costs were estimated to equal 7.5% of the total required fence length required times \$3.5/foot over 10 years.

1.1.4 Results: Stream fencing cost estimates

The number of fencing systems that might be implemented was estimated by sub-watershed by considering the total fencing estimate for streams bordering pasture. The estimated length of stream bordering pasture in the Falling River watershed is 660,577 feet (Table 1). The difference between the adjoining pasture length and the total fencing estimate is the systems that were installed during and after TMDL development (October 1990 – December 2006). It is anticipated that the fencing need will be addressed using either the SL-6 or WP-2T practices, CREP or FR-1. While cost share is available through the WP-2T practice for stream crossings in order to provide livestock with a watering source, the WP-2T practice does not provide assistance for off-stream watering or cross fencing.

The summary of the number of practices and estimated costs are summarized in Table 2.

Table 2 Cost estimates for Falling River stream exclusion BMPs

System	Unit	Quantity	Unit Cost	Total¹
SL-6 systems	System	585	\$7,015	\$4,106,074
WP-2T systems	System	31	\$2,976	\$91,674
Streamside fencing replacement	Linear ft	46,808	\$3.50/ft	\$163,828
Total				\$4,361,577

¹ The total fencing cost was obtained by subtracting the amount of fence installed before and after TMDL development 36,468 feet).