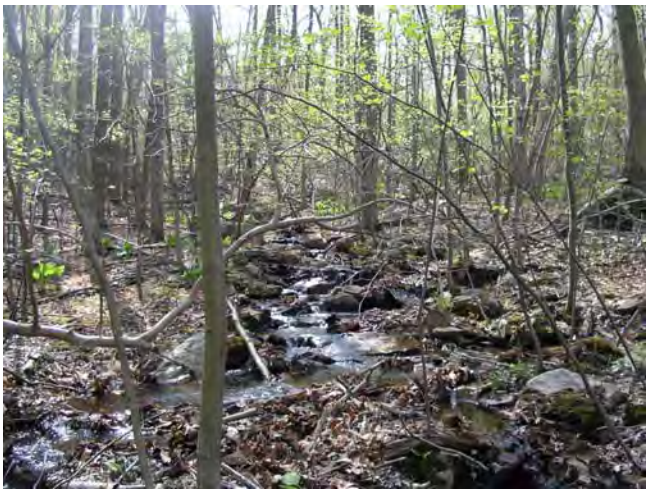
1. Epifaunal Substrate/Available Cover

Optimal

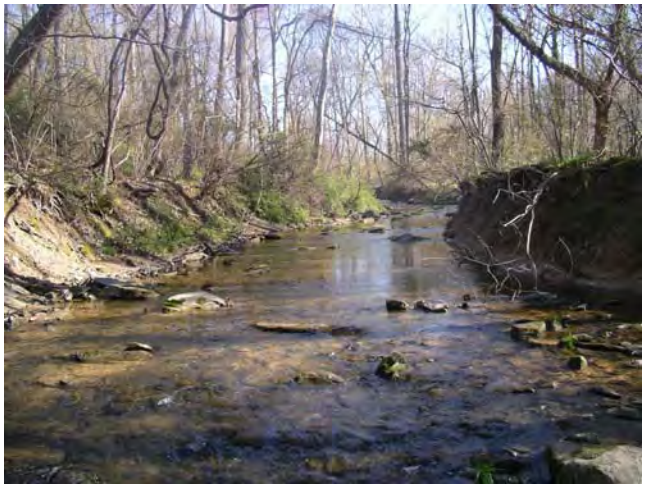
Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e. logs/snags that are not new fall and not transient).



Range 20 19 18 17 16

Suboptimal

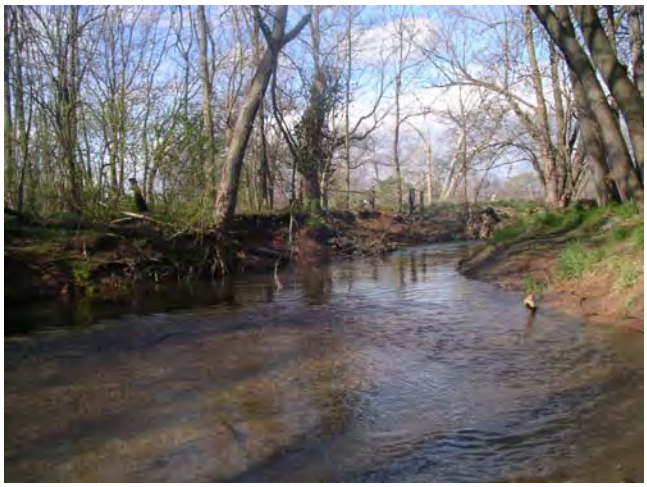
40-70% mix of stable habitat well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization – may rate at high end of scale.



Range 15 14 13 12 11

Marginal

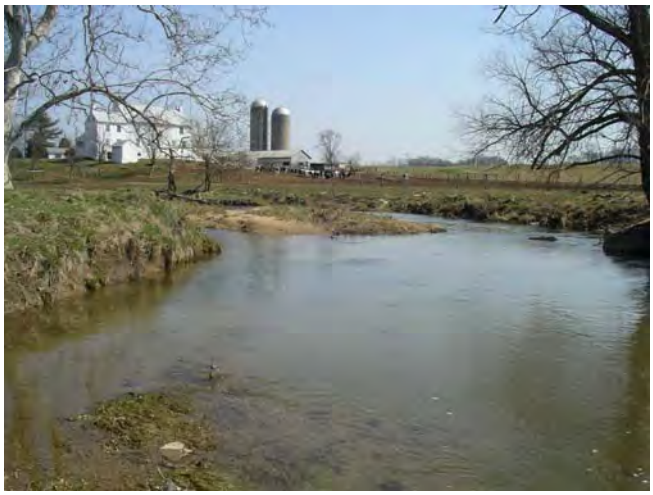
20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.



Range 10 9 8 7 6

Poor

Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.

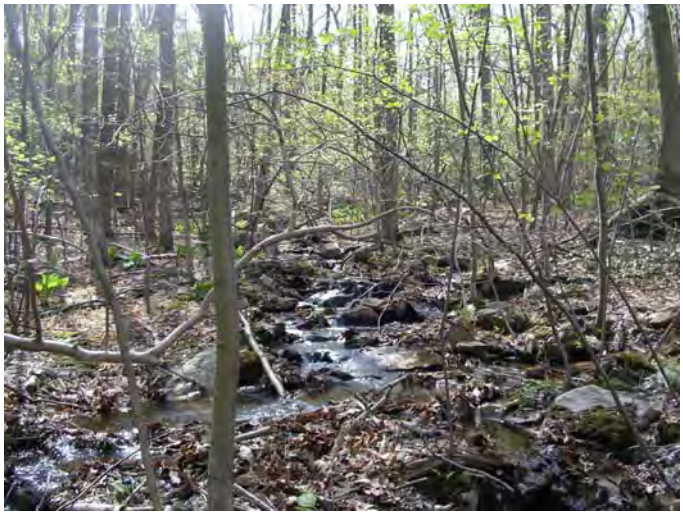


Range 5 4 3 2 1

2. Embeddedness

Optimal

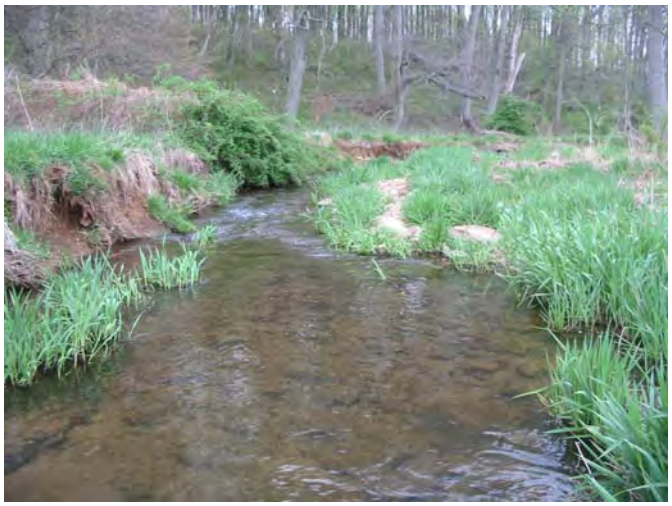
Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.



Range 20 19 18 17 16

Suboptimal

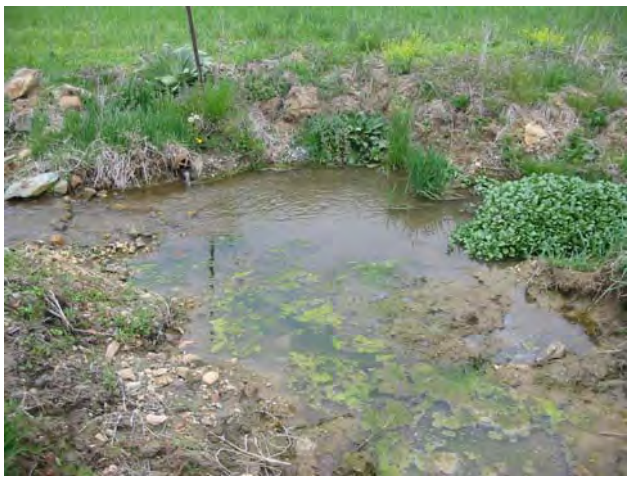
Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.



Range 15 14 13 12 11

Marginal

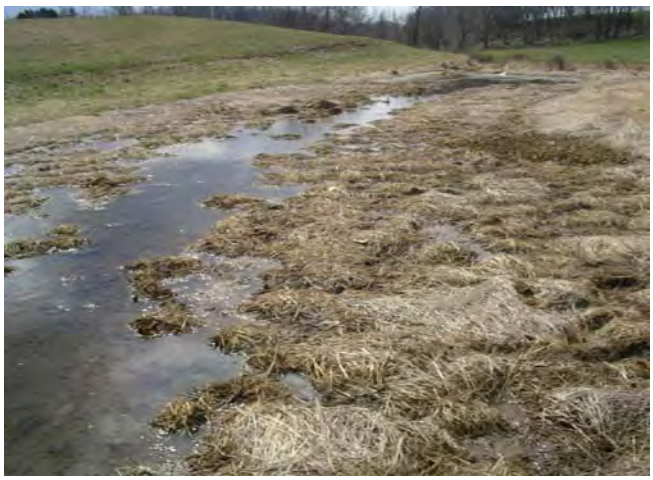
Gravel, cobble, and boulder particles are 50-75% surrounded by fine particles.



Range 10 9 8 7 6

Poor

Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.

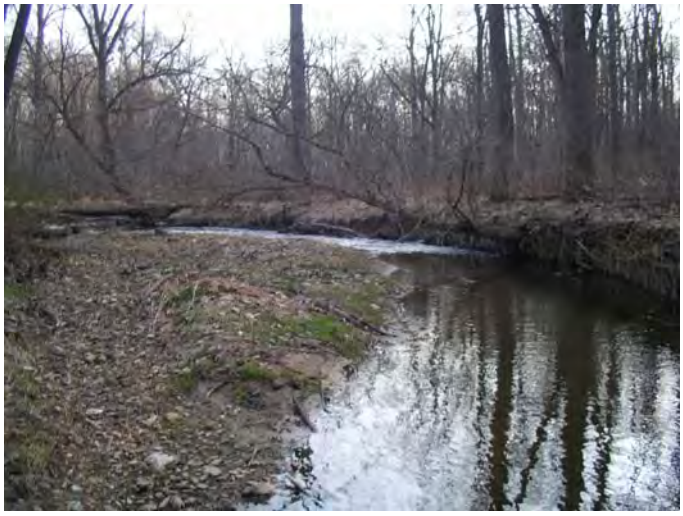


Range 5 4 3 2 1

3. Velocity/Depth Regime

Optimal

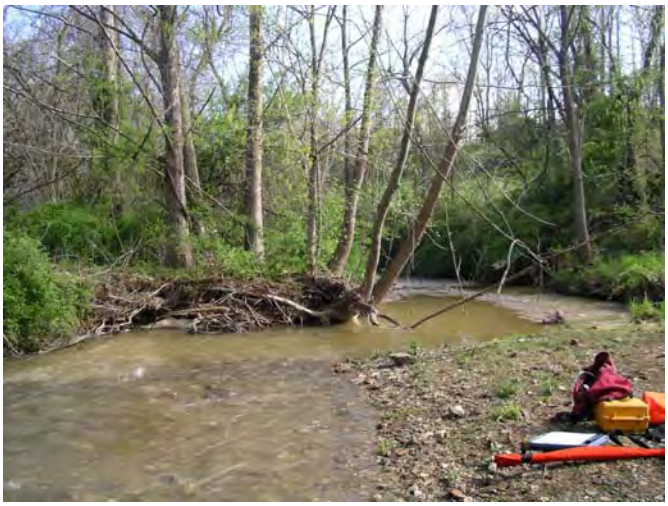
All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). Slow is <0.3 m/s, deep >0.5 m.



Range 20 19 18 17 16

Suboptimal

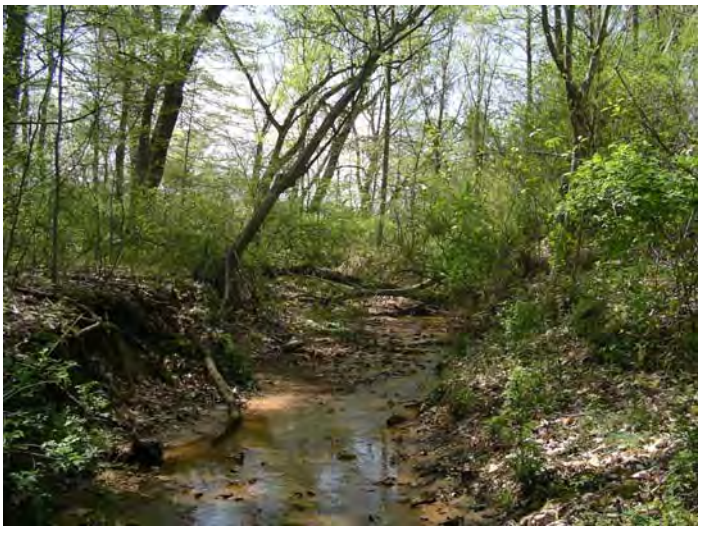
Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).



Range 15 14 13 12 11

Marginal

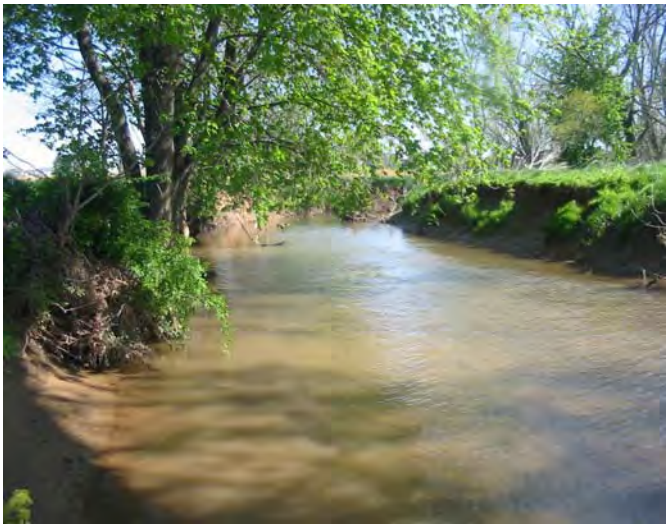
Only 2 or the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).



Range 10 9 8 7 6

Poor

Dominated by 1 velocity depth regime (usually slow-deep).

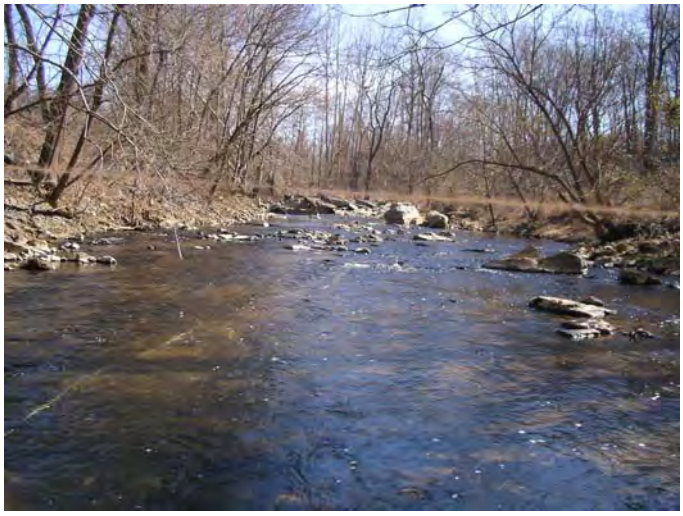


Range 5 4 3 2 1

4. Sediment Deposition

Optimal

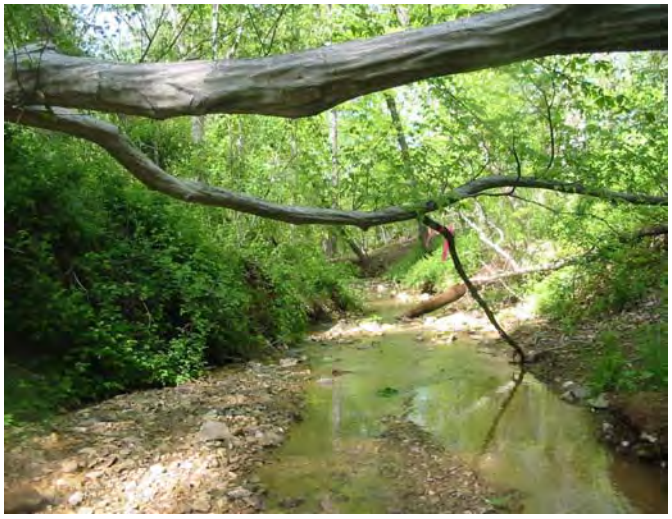
Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.



Range 20 19 18 17 16

Suboptimal

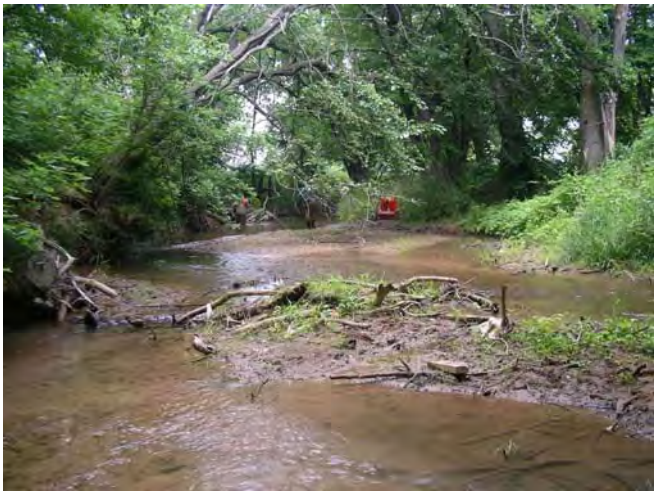
Some new increase in bar formation, mostly from gravel, sand or fine sediment. 5-30% (20-50%% for low-gradient) of the bottom affected; slight deposition in pools.



Range 15 14 13 12 11

Marginal

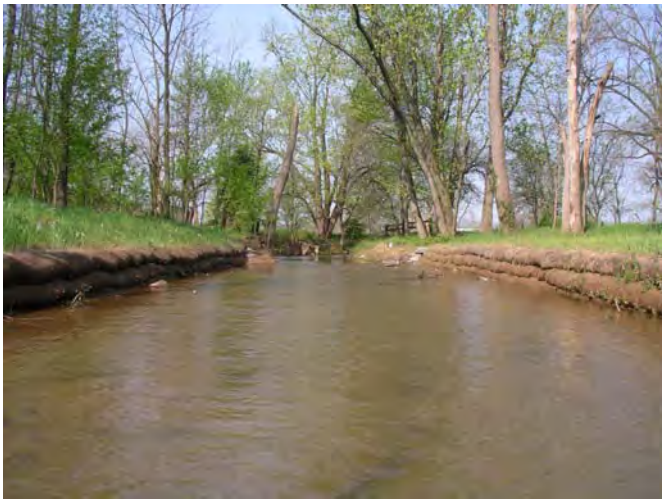
Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) or the bottom affected.



Range 10 9 8 7 6

Poor

Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent.

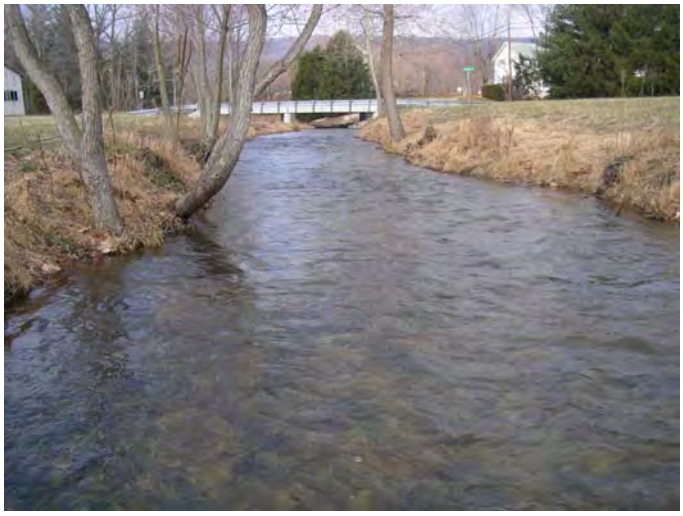


Range 5 4 3 2 1

5. Channel Flow Status

Optimal

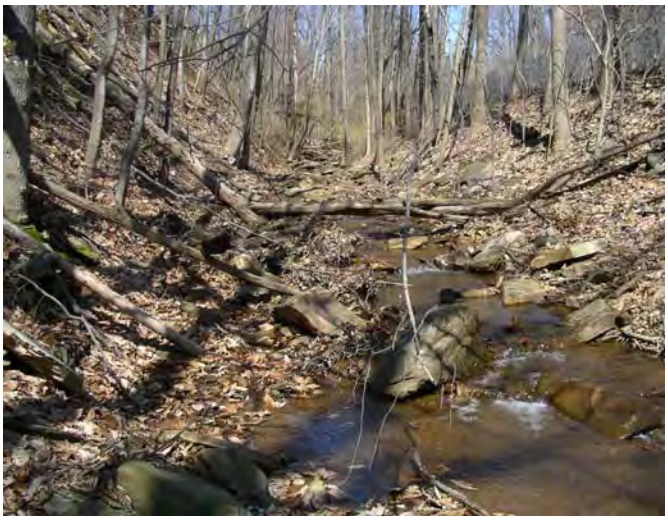
Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.



Range 20 19 18 17 16

Suboptimal

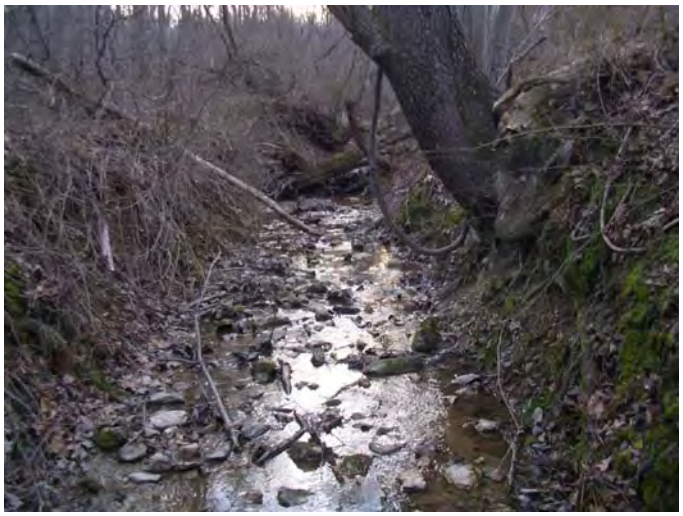
Water fills >75% of the available channel; or 25% of channel substrate is exposed.



Range 15 14 13 12 11

Marginal

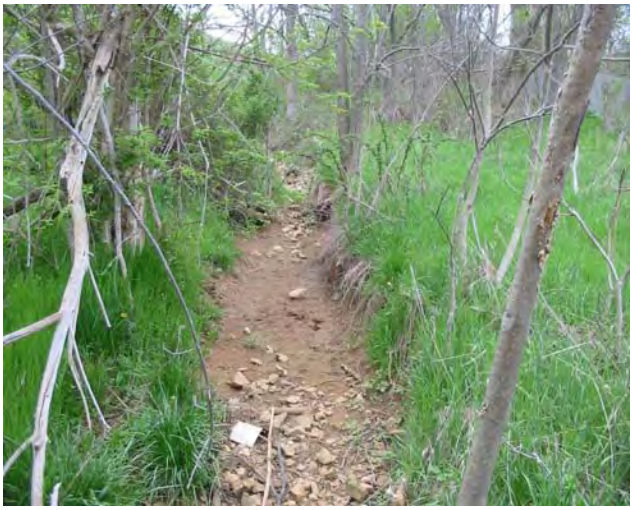
Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.



Range 10 9 8 7 6

Poor

Very little water in channel and mostly present as standing pools.

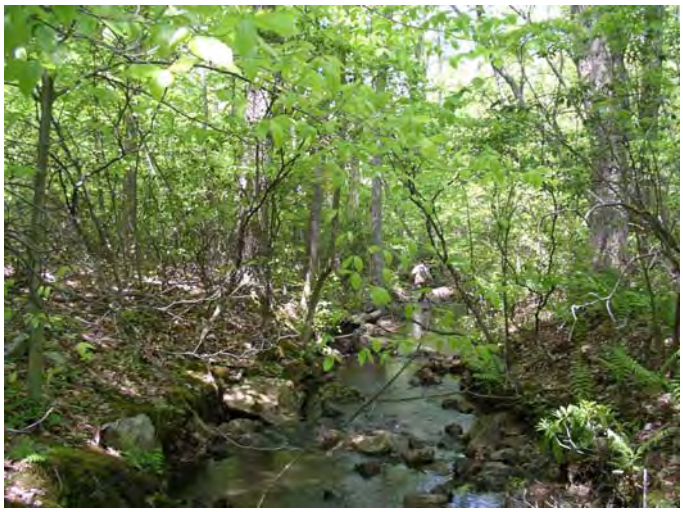


Range 5 4 3 2 1

6. Channel Alteration

Optimal

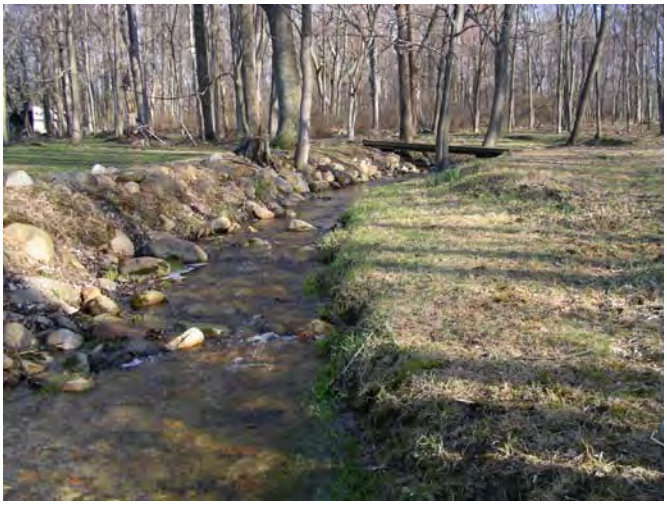
Channelization or dredging absent or minimal; stream with normal pattern.



Range 20 19 18 17 16

Suboptimal

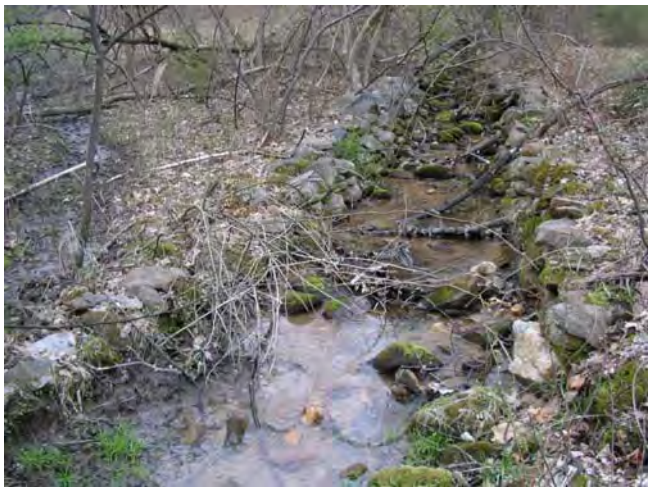
Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging (more than 20 years ago) may be present, but recent channelization is not present.



Range 15 14 13 12 11

Marginal

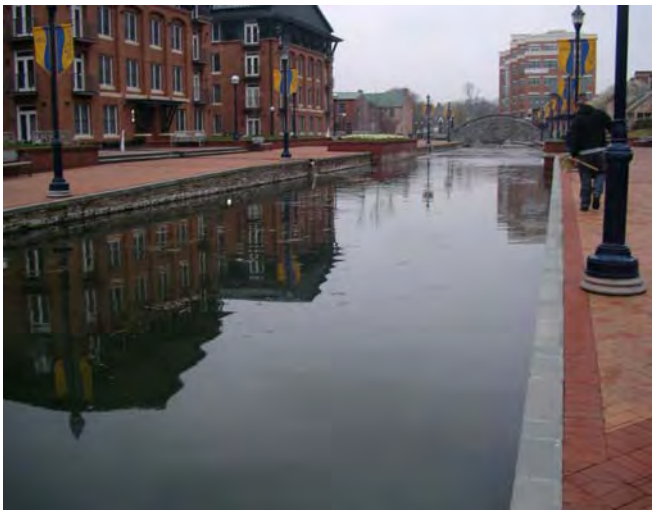
Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.



Range 10 9 8 7 6

Poor

Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.

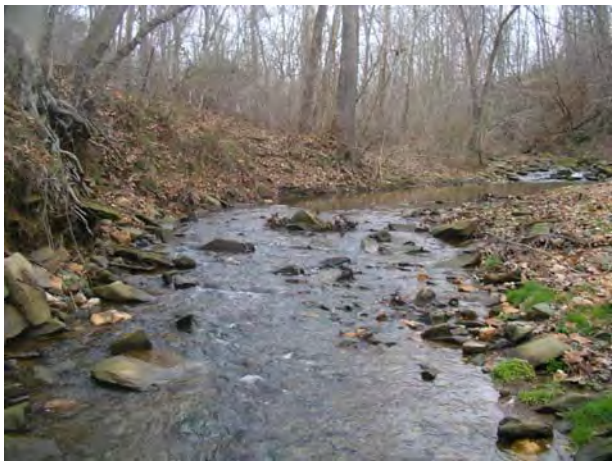


Range 5 4 3 2 1

7. Frequency of Riffles (or bends)

Optimal

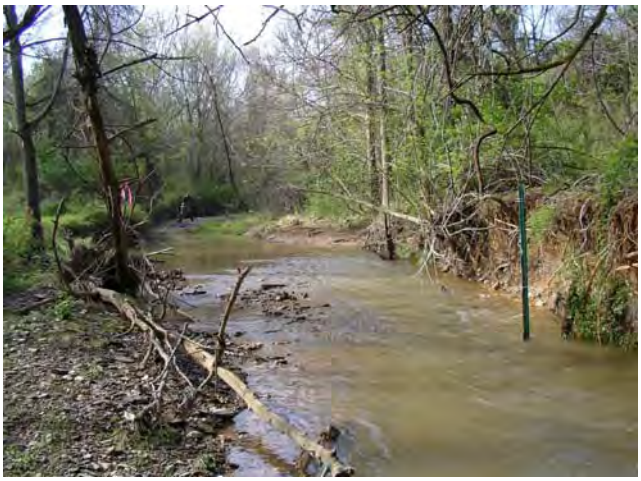
Occurrences of riffles relatively frequent ratio of distance btw. Riffles divided by width of the stream <7.1 (generally 5 to 7): variety of habitats is key. In streams where riffles are continuous, placement of boulders or other large, natural obstructions is important.



Range 20 19 18 17 16

Suboptimal

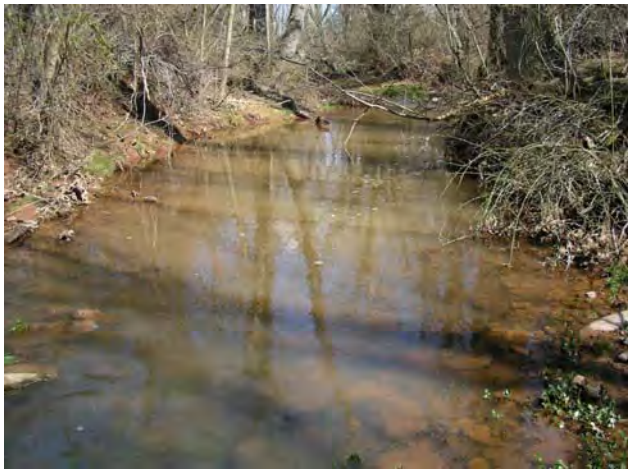
Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.



Range 15 14 13 12 11

Marginal

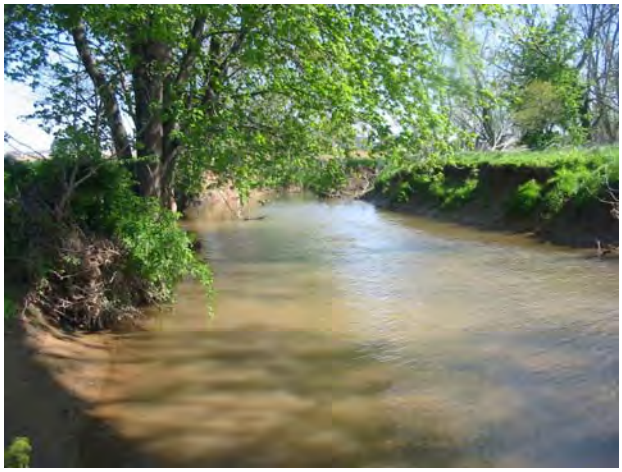
Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by width of the stream is between 15 to 25.



Range 10 9 8 7 6

Poor

Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.



Range 5 4 3 2 1

8. Bank Stability (score each bank)

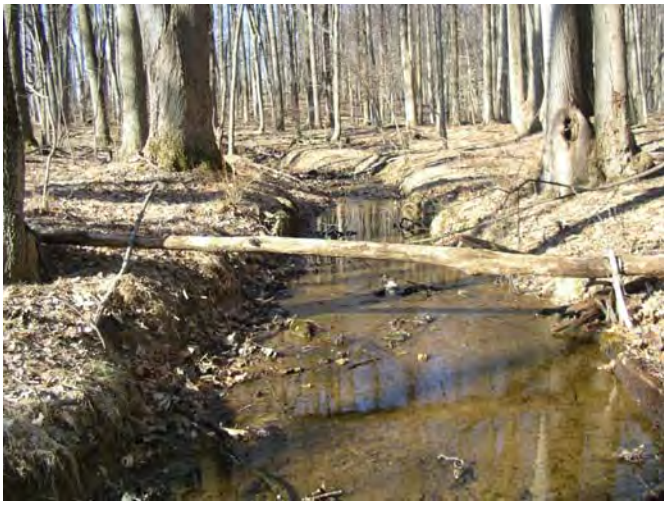
Optimal

Banks stable; evidence of erosion of bank failure absent or minimal; little potential for future problems. <5% of bank affected.

Range 10 9

Suboptimal

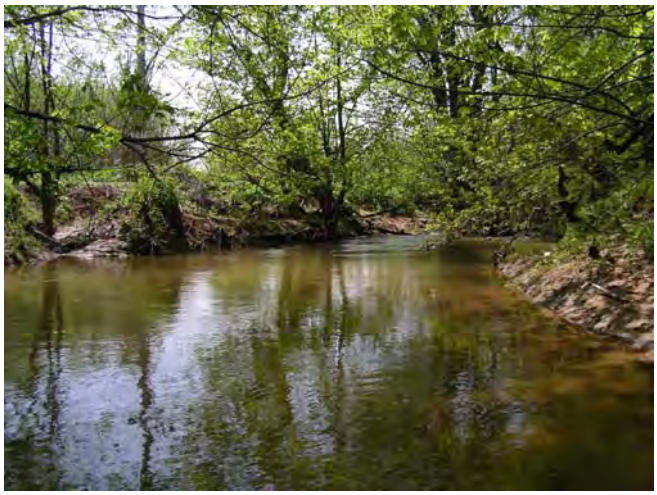
Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.



Range 8 7 6

Marginal

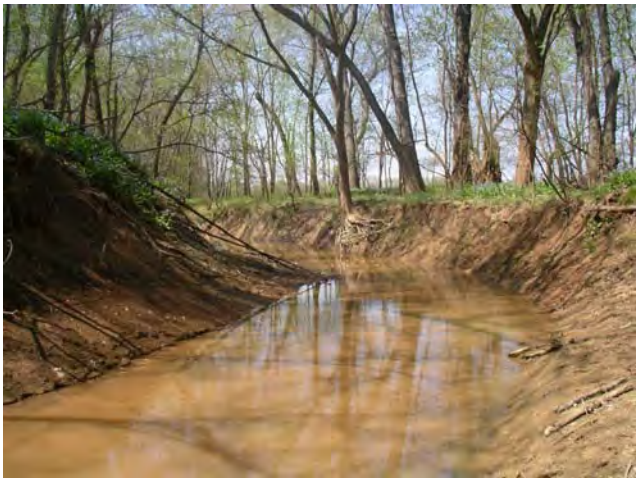
Moderately unstable; 30-60% of bank in reach has areas or erosion; high erosion potential during floods.



Range 5 4 3

Poor

Unstable, many eroded areas; “raw” areas frequent long straight sections and bands; obvious bank sloughing; 60-100% of bank has erosional scars.



Range 2 1 0

9. Vegetative Protection (score each bank)

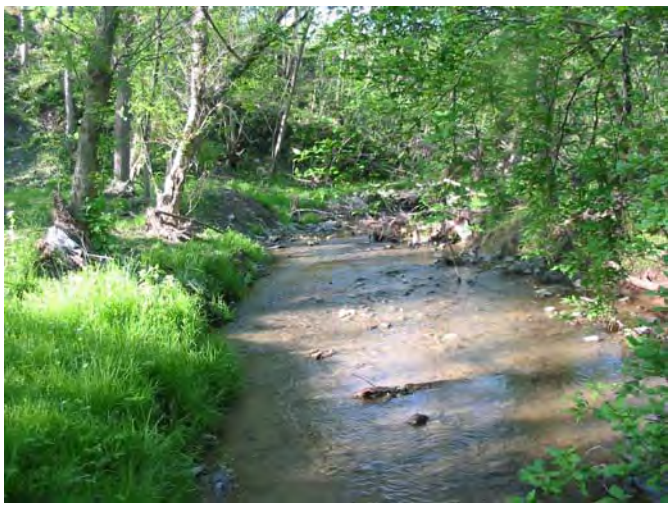
Optimal

More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation including trees, understory shrubs, or non-woody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.

Range 10 9

Suboptimal

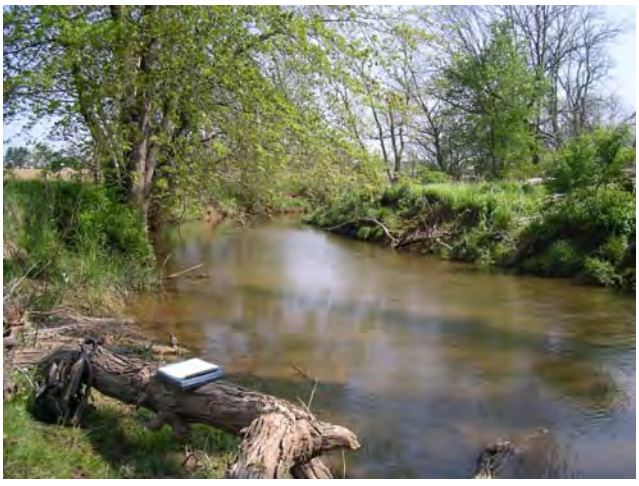
70-90% of stream bank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than ½ of the potential plant stubble height remaining.



Range 8 7 6

Marginal

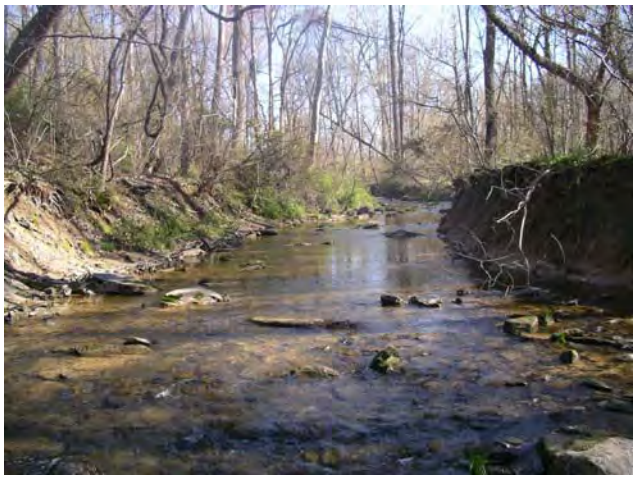
50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ of the potential plant stubble height remaining.



Range 5 4 3

Poor

Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has been removed to 5 cm or less in average stubble height.

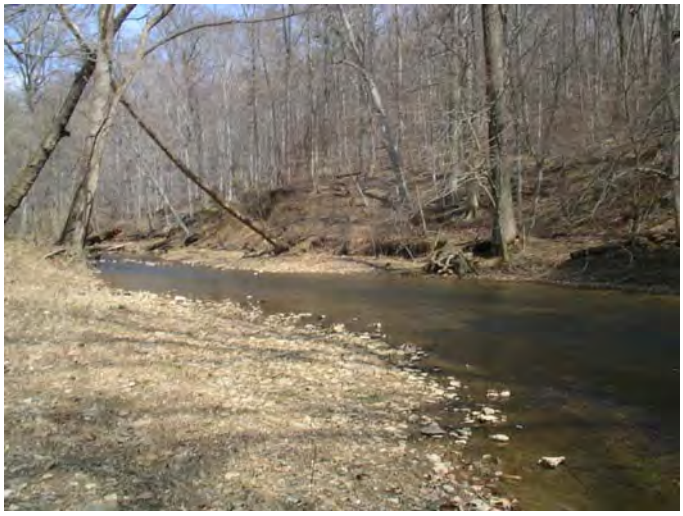


Range 2 1 0

10. Riparian Vegetative Zone Width (score each bank)

Optimal

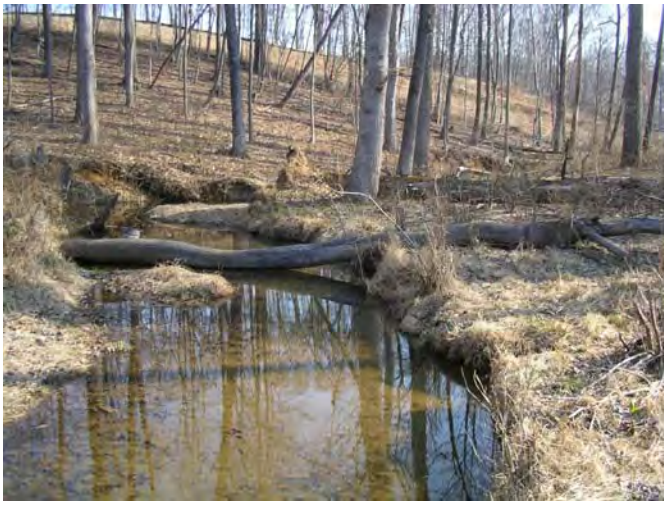
Width of riparian zone >18 m; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns or crops) have not impacted zone.



Range 10 9

Suboptimal

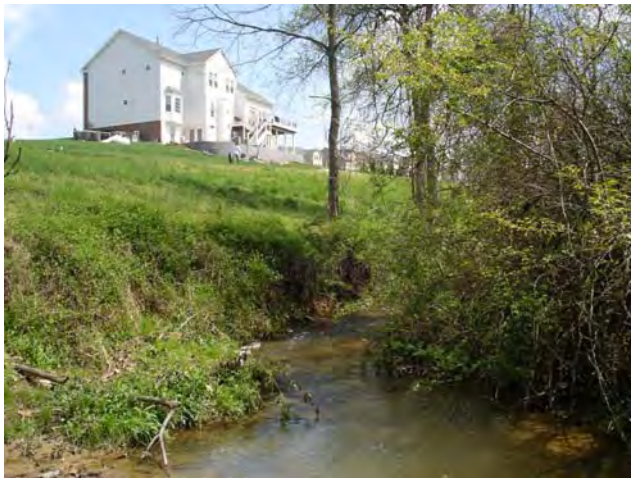
Width of riparian zone 12-18 m; human activities have impacted zone minimally.



Range 8 7 6

Marginal

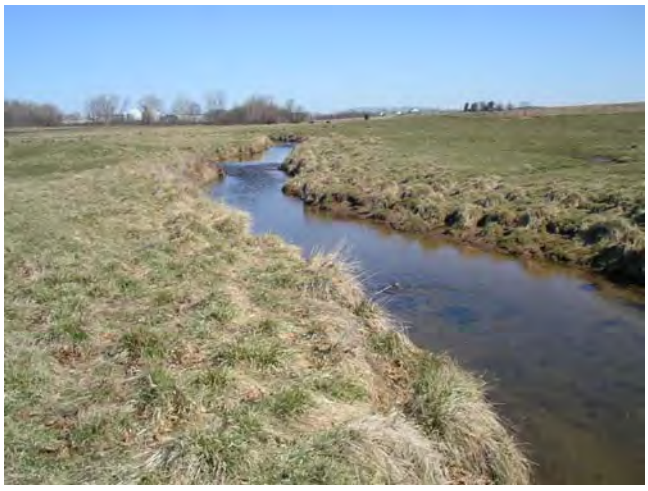
Width of riparian zone 6-12 m; human activities have impacted zone a great deal.



Range 5 4 3

Poor

Width of riparian zone <6 m; little or no riparian vegetation due to human activities.



Range 2 1 0