NRCS Stream Visual Assessment Protocol 2 (SVAP2)

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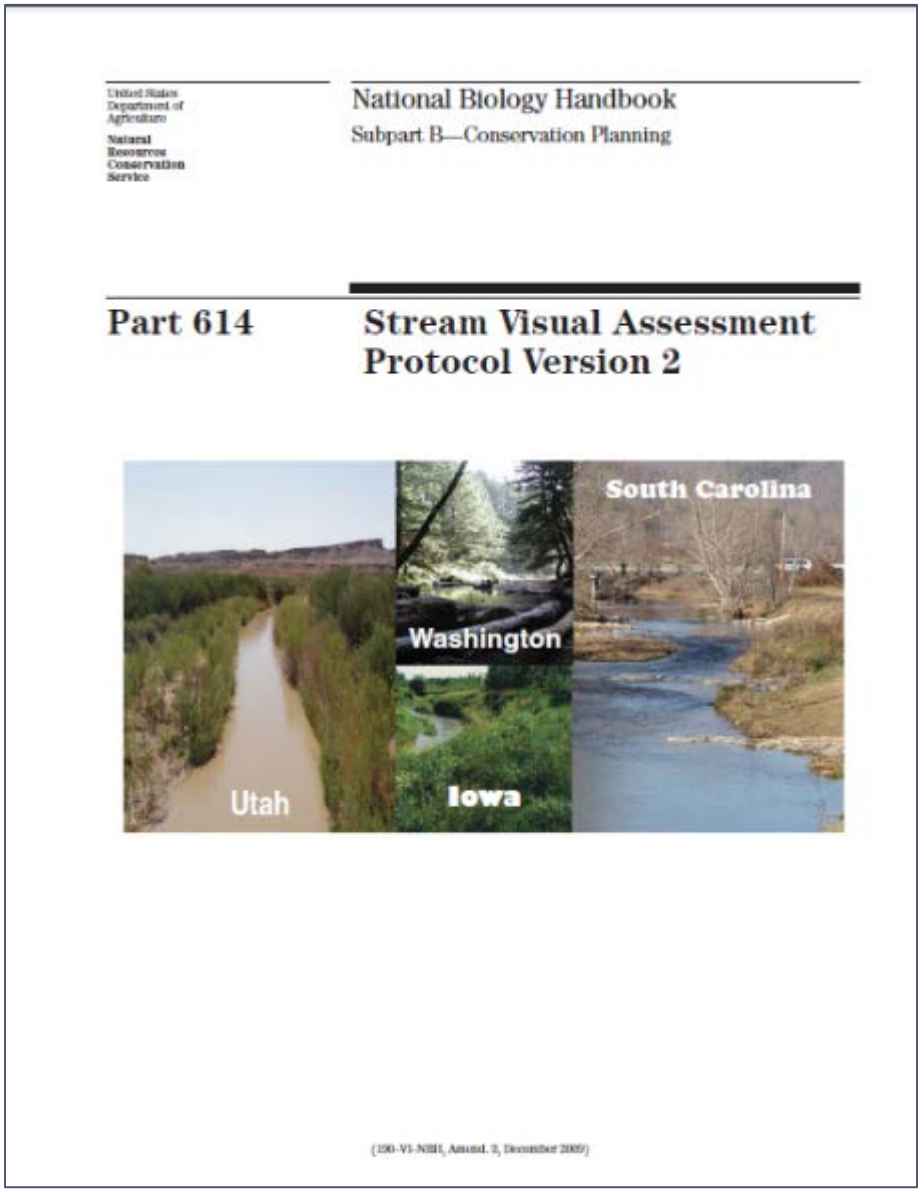
The Stream Visual Assessment Protocol 2 (SVAP2) is a national protocol that provides an initial evaluation of the overall condition of wadeable streams, their riparian zones, and their instream habitats.

Web link:
http://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=nrcseprd403210&ext=pdf



Who is the target user?

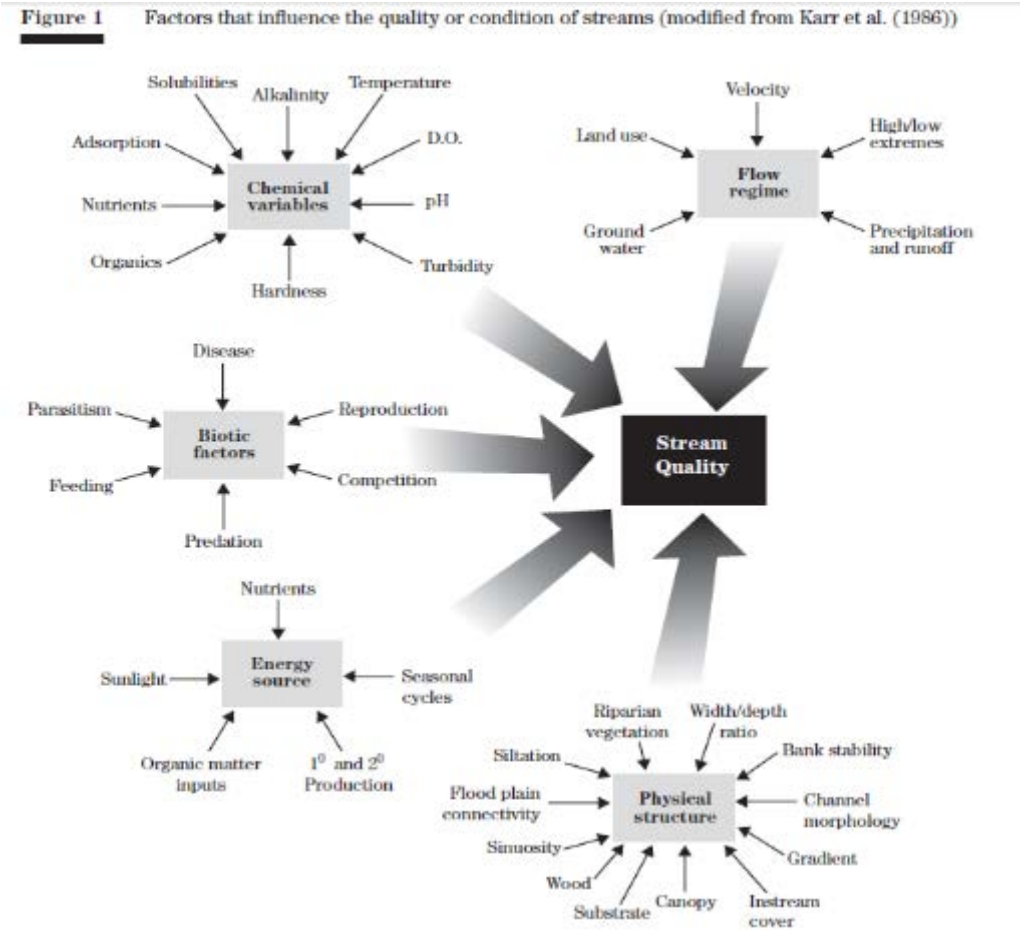
- field conservationists
- landowners
- partners / volunteers
- Those with little training or experience

Goals

- simple resource assessment
- education
- Problem/resource concern identification
- before / after evaluation
- “hook” user

SVAP 2

- 2-page assessment sheet
- match descriptions to what you see
- average the scores
- overall narrative rating



Site Selection

- one reach per assessment
- reach = 12X width of stream channel at bankfull stage
- separate assessment for each significantly different type of reach

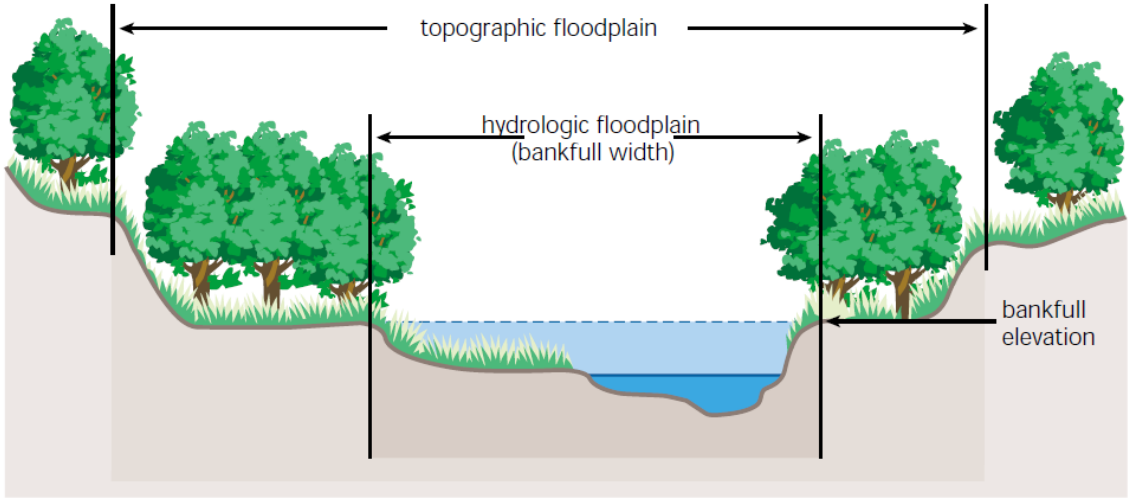


Figure 1.20: Hydrologic and topographic floodplains. *The hydrologic floodplain is defined by bankfull elevation. The topographic floodplain includes the hydrologic floodplain and other lands up to a defined elevation.*

Assessment Sheets

- basic information about ownership, land use, ecoregion, stream characteristics, etc.; include diagram of area
- scoring results for each assessment element

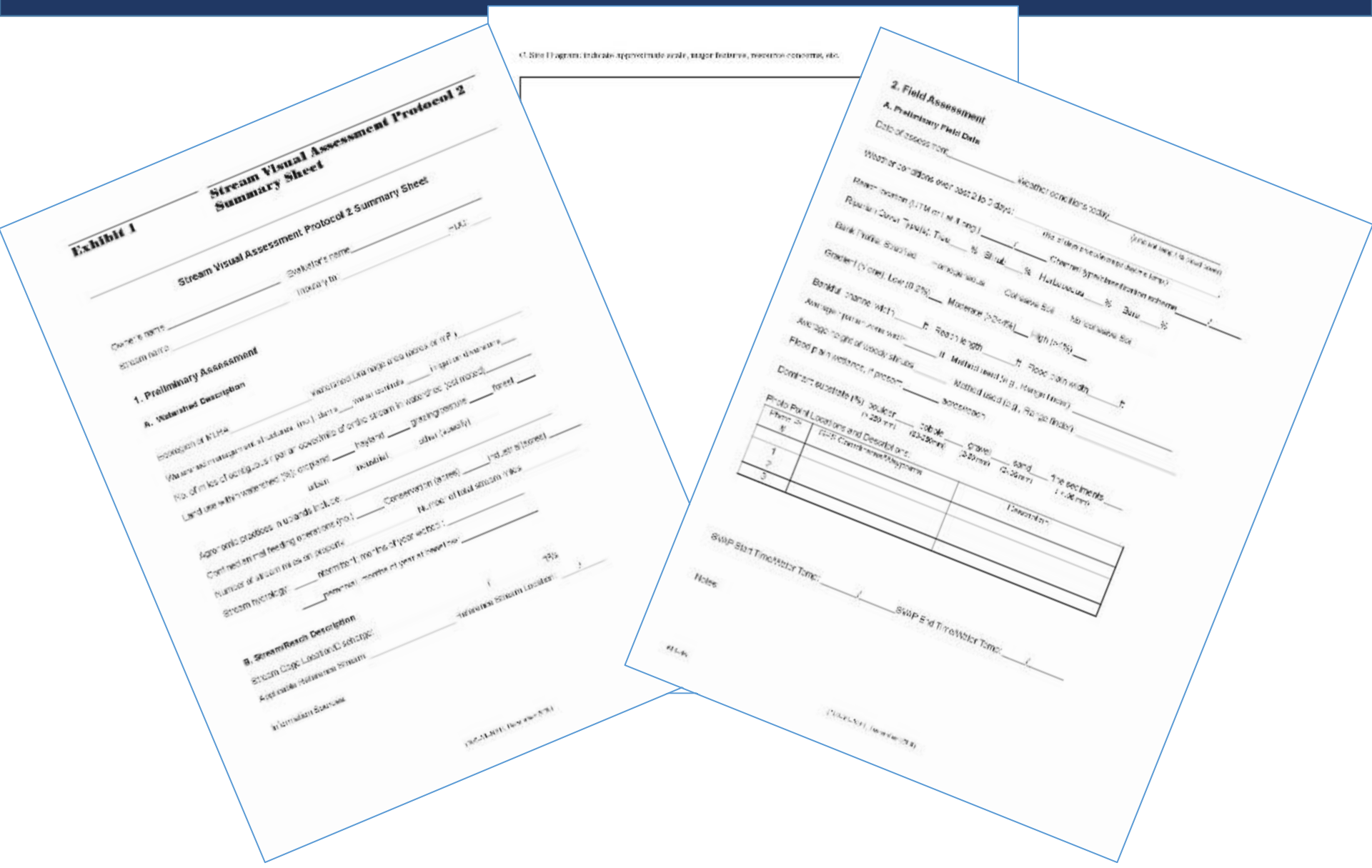


Exhibit 1

Stream Visual Assessment Protocol 2 Summary Sheet

Stream Visual Assessment Protocol 2 Summary Sheet

1. Preliminary Assessment

A. Watershed Description

2. Field Assessment

A. Preliminary Field Data

B. Stream/Reach Description

Scoring

- maximum 16 stream elements to score
- range of scores: 10 (best conditions) to 0 (worst conditions)
- score only elements that are appropriate

B. Element Scores

Element	Score	Element	Score
1. Channel Condition		14. Aquatic Invertebrate Community	
2. Hydrologic Alteration		15. Riffle Embeddedness	
3. Bank Condition		16. Salinity	
4. Riparian Area Quantity		**A. Sum of all elements scored**	
5. Riparian Area Quality		**B. Number of elements scored**	
6. Canopy Cover			
7. Water Appearance		**Overall score: A/B** _____	
8. Nutrient Enrichment			
9. Manure or Human Waste		1 to 2.9 Severely Degraded 3 to 4.9 Poor 5 to 6.9 Fair 7 to 8.9 Good 9 to 10 Excellent	
10. Pools			
11. Barriers to Movement			
12. Fish Habitat Complexity			
13. Aquatic Invertebrate Habitat			

Suspected causes of SVAP scores less than 5 (does not meet quality criteria for stream species)

Recommendations for further assessment or actions:

Riparian wildlife habitat recommendations:

(180-VI-NBH, December 2009) 614-47

Overall assessment calculation & interpretation

- sum values of elements scored
- divide sum by number of elements scored
- compare numerical score with narrative rating criteria
- narrative ratings - excellent to poor

Element 1 - Channel Condition

Element 1 Channel condition

Natural, stable channel with established bank vegetation	**If channel is incising (appears to be downcutting or degrading), score this element based on the descriptions in the upper section of the matrix**		
No discernible signs of incision (such as vertical banks) or aggradation (such as very shallow multiple channels)	Evidence of past incision and some recovery; some bank erosion possible	Active incision evident; plants are stressed, dying or falling in channel	Headcuts or surface cracks on banks; active incision; vegetation very sparse
Active channel and flood plain are connected throughout reach, and flooded at natural intervals	Active channel and flood plain are connected in most areas, inundated seasonally	Active channel appears to be disconnected from the flood plain, with infrequent or no inundation	Little or no connection between flood plain and stream channel and no inundation
Streambanks low with few or no bank failures	Streambanks may be low or appear to be steepening	Steep banks, bank failures evident or imminent	Steep streambanks and failures prominent
Stage I : Score 10 Stage V: Score 9 (if terrace is visible)	Top of point bars are below active flood plain	Point bars located adjacent to steep banks	Point bars, if present, located adjacent to steep banks
	Stage I: Score 8 Stage V: Score 7–8 Stage IV: Score 6	Stage IV: Score 5 Stage III: Score 4 Stage II: Score 3	Stage II or III, scores ranging from 2 to 0, depending on severity
	8 7 6	**5 4 3**	**2 1 0**
	If channel is aggrading (appears to be filling in and is relatively wide and shallow), score this element based on the descriptions in the lower section of the matrix		
	Minimal lateral migration and bank erosion	Moderate lateral migration and bank erosion	Severe lateral channel migration, and bank erosion
	A few shallow places in reach, due to sediment deposits	Deposition of sediments causing channel to be very shallow in places	Deposition of sediments causing channel to be very shallow in reach
No more than 1 bar forming in channel	Minimal bar formation (less than 3)	3–4 bars in channel	Braided channels (5 or more bars in channel)
10 9	**8 7 6**	**5 4 3**	**2 1 0**

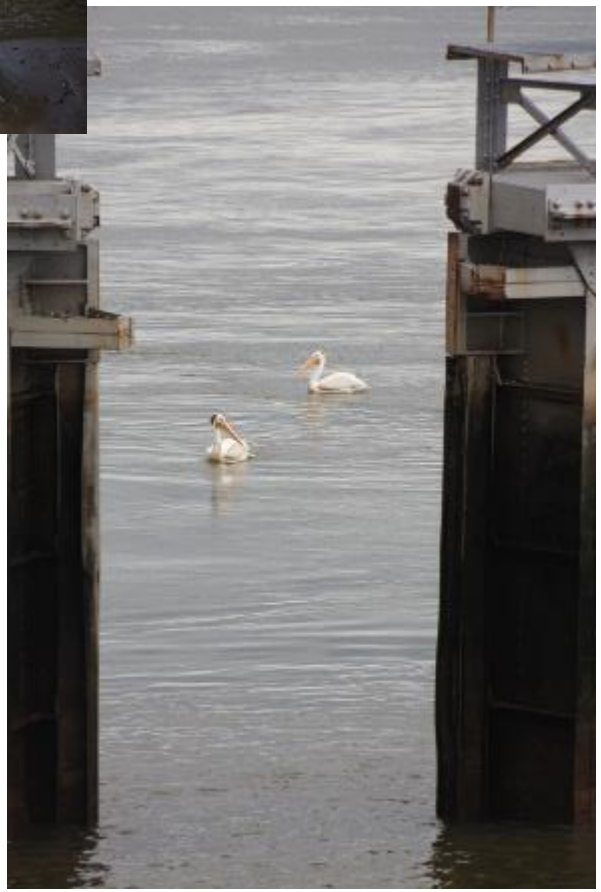
Element 2 - Hydrologic Alteration

Element 2 Hydrologic alteration

Bankfull or higher flows occur according to the flow regime that is characteristic of the site, generally every 1 to 2 years **and** No dams, dikes, or development in the flood plain[1/], or water control structures are present **and** natural flow regime[2/] prevails	Bankfull or higher flows occur only once every 3 to 5 years or less often than the local natural flow regime Developments in the flood plain, stream water withdrawals, flow augmentation, or water control structures may be present, but do not significantly alter the natural flow regime[2/]	Bankfull or higher flows occur only once every 6 to 10 years, or less often than the local natural flow regime Developments in the flood plain, stream water withdrawals, flow augmentation, or water control structures alter the natural flow regime[2/]	Bankfull or higher flows rarely occur Stream water withdrawals completely dewater channel; and/or flow augmentation, stormwater, or urban runoff discharges directly into stream and severely alters the natural flow regime[2/]
10 9	**8 7 6**	**5 4 3**	**2 1 0**

1/ Development in the flood plain refers to transportation infrastructure (roads, railways), commercial or residential development, land conversion for agriculture or other uses, and similar activities that alter the timing, concentration, and delivery of precipitation as surface runoff or subsurface drainage.

2/ As used here, "natural flow regime" refers to streamflow patterns unaffected by water withdrawals, flood plain development, agricultural or wastewater effluents, and practices that change surface runoff (dikes and levees) or subsurface drainage (tile drainage systems).



Element 3 - Bank Condition

Element 3 Bank condition

Banks are stable; protected by roots of natural vegetation, wood, and rock [1/] No fabricated structures present on bank No excessive erosion or bank failures [2/] No recreational or livestock access			Banks are moderately stable, protected by roots of natural vegetation, wood, or rock or a combination of materials Limited number of structures present on bank Evidence of erosion or bank failures, some with reestablishment of vegetation Recreational use and/or grazing do not negatively impact bank condition			Banks are moderately unstable; very little protection of banks by roots of natural wood, vegetation, or rock Fabricated structures cover more than half of reach or entire bank Excessive bank erosion or active bank failures Recreational and/or livestock use are contributing to bank instability			Banks are unstable; no bank protection with roots, wood, rock, or vegetation Riprap and/or other structures dominate banks Numerous active bank failures Recreational and/or livestock use are contributing to bank instability		
Right bank	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Left bank	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**

1/ Natural wood and rock does not mean riprap, gabions, log cribs, or other fabricated revetments.
2/ Bank failure refers to a section of streambank that collapses and falls into the stream, usually because of slope instability.

Questions?

Elements 4 - Riparian area quantity

Element 4 Riparian area quantity

	Natural plant community extends at least two bankfull widths or more than the entire active flood plain and is generally contiguous throughout property			Natural plant community extends at least one bankfull width or more than 1/2 to 2/3 of active flood plain and is generally contiguous throughout property Vegetation gaps do not exceed 10% of the estimated length of the stream on the property			Natural plant community extends at least 1/2 of the bankfull width or more than at least 1/2 of active flood plain Vegetation gaps do not exceed 30% of the estimated length of the stream on the property			Natural plant community extends at least 1/3 of the bankfull width or more than 1/4 of active flood plain Vegetation gaps exceed 30% of the estimated length of the stream on the property			Natural plant community extends less than 1/3 of the bankfull width or less than 1/4 of active flood plain Vegetation gaps exceed 30% of the estimated length of the stream on the property		
Right bank	**10**	**9**		**8**	**7**		**6**	**5**		**4**	**3**	**2**		**1**	**0**	
Left bank	**10**	**9**		**8**	**7**		**6**	**5**		**4**	**3**	**2**		**1**	**0**	

Note: Score each bank separately. Scores should represent the entire stream riparian area within the property. Score for this element = left bank score plus right bank score divided by 2. If the score of one bank is 7 or greater and the score of the other bank is 4 or less, subtract 2 points from final score.

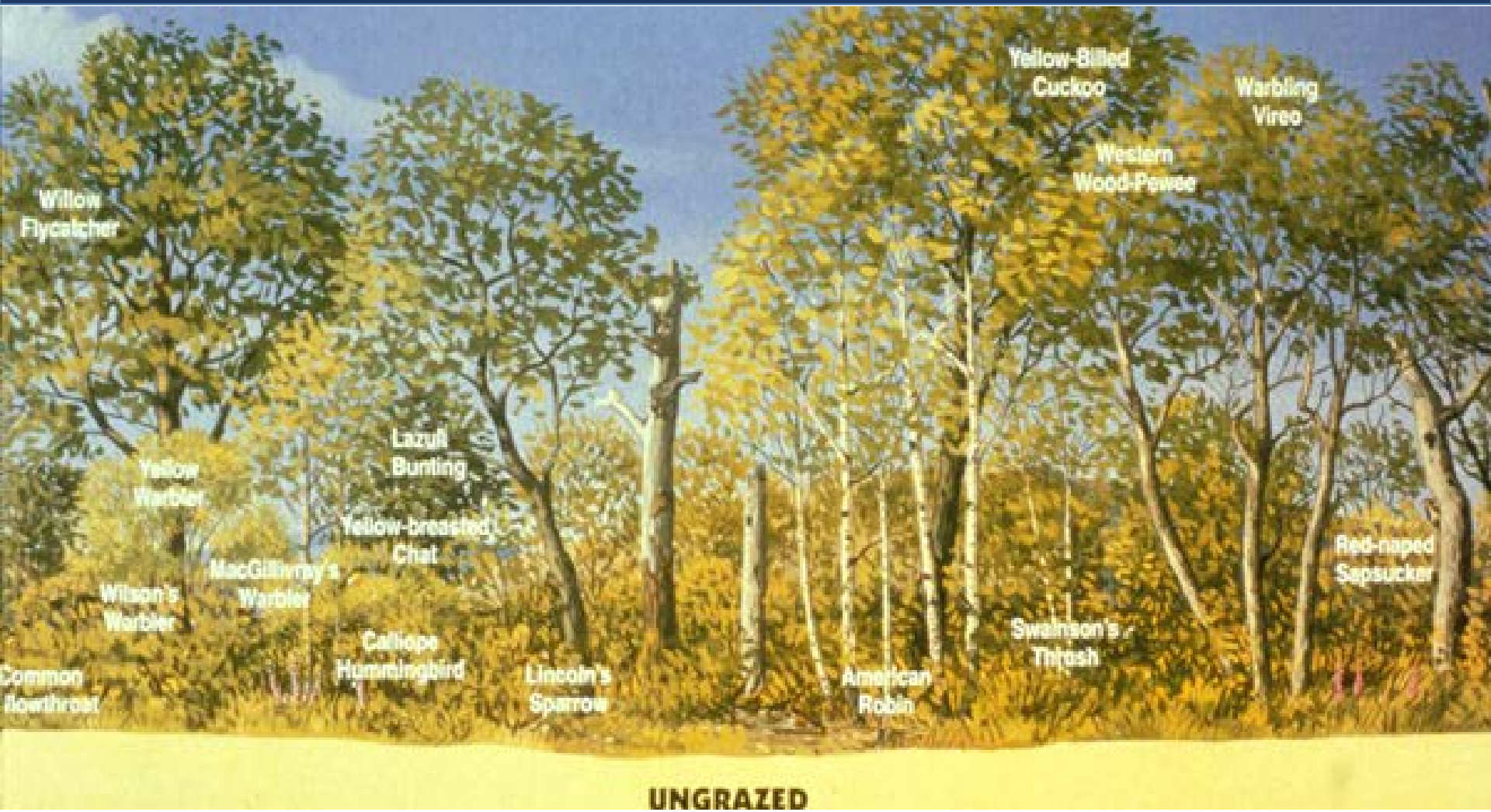

Yankee Rd
262nd St
Cedar Clinton Rd
Y4F
210th St
268th St
Google earth
© 2015 Google
3000 ft
N

Element 5 - Riparian area quality

Element 5 Riparian area quality

	Natural and diverse riparian vegetation with composition, density and age structure appropriate for the site No invasive species or concentrated flows through area			Natural and diverse riparian vegetation with composition, density and age structure appropriate for the site: Little or no evidence of concentrated flows through area Invasive species present in small numbers (20% cover or less)			Natural vegetation compromised Evidence of concentrated flows running through the riparian area Invasive species common (>20% <50% cover)			Little or no natural vegetation Evidence of concentrated flows running through the riparian area Invasive species widespread (>50% cover)		
Right bank	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Left bank	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**

Notes: Score should represent the entire stream riparian area within the property.
Score for this element = left bank score plus right bank score divided by 2.


Yellow-Billed Cuckoo
Warbling Vireo
Western Wood-Pewee
Willow Flycatcher
Lazuli Bunting
Yellow Warbler
Yellow-breasted Chat
MacGillivray's Warbler
Wilson's Warbler
Red-naped Sapsucker
Calliope Hummingbird
Swainson's Thrush
Common Yellowthroat
Lincoln's Sparrow
American Robin
UNGRAZED

Element 6 - Canopy Cover

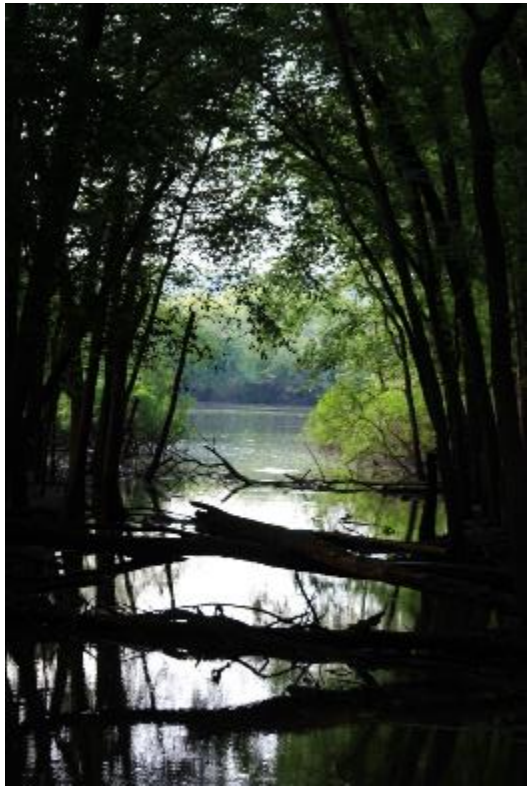
Element 6 Canopy cover

(a) Cold-water streams

>75% of water surface shaded within the length of the stream in landowner's property			75–50% of water surface shaded within the length of the stream in landowner's property			49–20% of water surface shaded within the length of the stream in landowner's property			<20% of water surface shaded within the length of the stream in landowner's property		
10	9		8	7	6	5	4	3	2	1	0

(b) Warm-water streams

50–75% of water surface shaded within the length of the stream in landowner's property			>75% of water surface shaded within the length of the stream in landowner's property			49–20% of water surface shaded within the length of the stream in landowner's property			<20% of water surface shaded within the length of the stream in landowner's property		
10	9		8	7	6	5	4	3	2	1	0



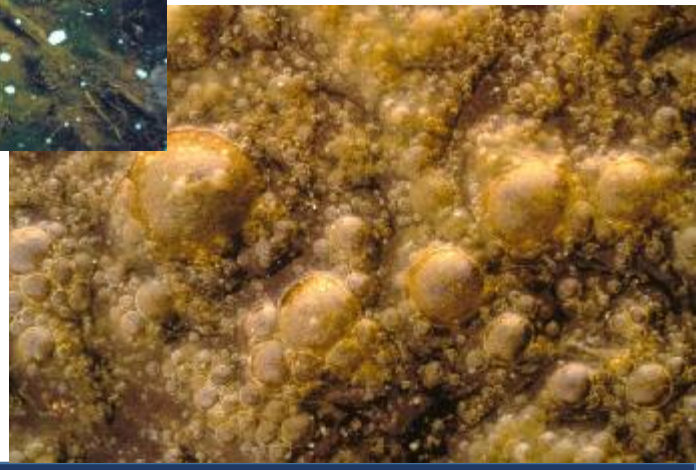
Element 7 - Water Appearance

Element 7 Water appearance			
Water is very clear, or clarity appropriate to site; submerged features in stream (rocks, wood) are visible at depths of 3 to 6 feet No motor oil sheen on surface; no evidence of metal precipitates in streams	Water is slightly turbid, especially after storm event, but clears after weather clears; submerged features in stream (rocks, wood) are only visible at depths of 1.5 to 3 feet No motor oil sheen on surface or evidence of metal precipitates in stream	Water is turbid most of the time; submerged features in stream (rocks, wood) are visible at depths of only .5 to 1.5 feet **and/or** Motor oil sheen is present on water surface or areas of slackwater **and/or** There is evidence of metal precipitates in stream	Very very turbid water most of the time; submerged features in stream (rocks, wood) are visible only within .5 feet below surface **and/or** Motor oil sheen is present on the water surface or areas of slackwater
10 9 8	**7 6 5**	**4 3 2**	**1 0**

Element 8 - Nutrient Enrichment

Element 8 Nutrient enrichment

Clear water along entire reach Little algal growth present	Fairly clear or slightly greenish water Moderate algal growth on substrates	Greenish water particularly in slow sections Abundant algal growth, especially during warmer months **and/or** Slight odor of ammonia or rotten eggs **and/or** Sporadic growth of aquatic plants within slack water areas	Pea green color present; thick algal mats dominating stream **and/or** Strong odor of ammonia or rotten eggs **and/or** Dense stands of aquatic plants widely dispersed
10 9	**8 7 6**	**5 4 3**	**2 1 0**



Element 9 Manure or Human Waste Presence

Element 9 Manure or human waste presence

Livestock do not have access to stream No pipes or concentrated flows discharging animal waste or sewage directly into stream	Livestock access to stream is controlled and/or limited to small watering or crossing areas No pipes or concentrated flows discharging animal waste or sewage directly into stream	Livestock have unlimited access to stream during some portion of the year Manure is noticeable in stream **and/or** Pipes or concentrated flows discharge treated animal waste or sewage directly into stream	Livestock have unlimited access to stream during entire year Manure is noticeable in stream **and/or** Pipes or concentrated flows discharge untreated animal waste or sewage directly into stream
10 9	**8 7 6**	**5 4 3**	**2 1 0**

Element 10 - Pools

Element 10 Pools: Low-gradient streams (<2%) scoring matrix

More than two deep pools separated by riffles, each with greater than 30% of the pool bottom obscured by depth, wood, or other cover Shallow pools also present	One or two deep pools separated by riffles, each with greater than 30% of the pool bottom obscured by depth wood, or other cover At least one shallow pool present	Pools present but shallow (<2 times maximum depth of the upstream riffle) Only 10–30% of pool bottoms are obscured due to depth or wood cover	Pools absent, but some slow water habitat is available No cover discernible **or** Reach is dominated by shallow continuous pools or slow water
10 9	**8 7 6**	**5 4 3**	**2 1 0**

Element 10 Pools: high-gradient streams (>2%) scoring matrix

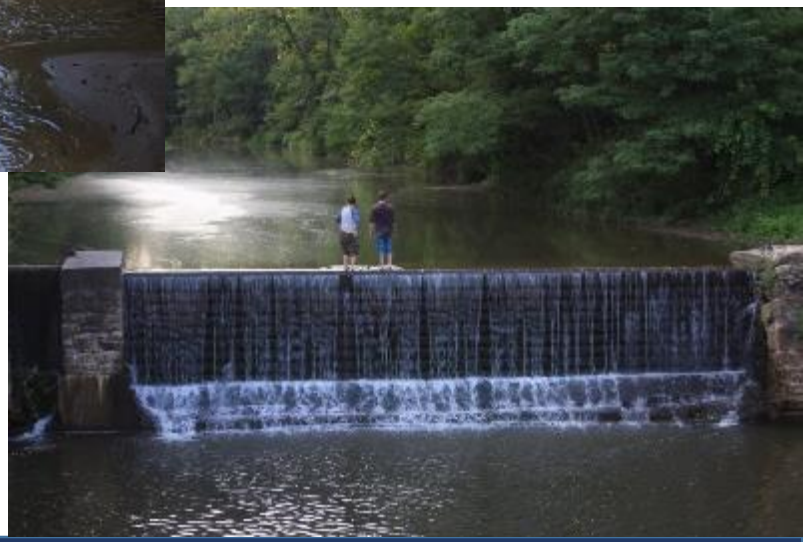
More than three deep pools separated by boulders or wood, each with greater than 30% of the pool bottom obscured by depth, wood, or other cover. For small streams, pool bottoms may not be completely obscured by depth, but pools are deep enough to provide adequate cover for resident fish Shallow pools also present	Two to three deep pools, each with greater than 30% of the pool bottom obscured by depth wood or other cover; at least one shallow pool present. For small streams, pool bottoms may not be completely obscured by depth, but pools are deep enough to provide some cover for resident fish At least one shallow pool also present	Pools present but relatively shallow, with only 10–30% of pool bottoms obscured by depth or wood cover. For small streams, pool bottoms may not be completely obscured by depth, but pools are deep enough to provide minimal cover for resident fish No shallow pools present	Pools absent
10 9	**8 7 6**	**5 4 3**	**2 1 0**

Questions?

Element 11 - Barriers to Aquatic Species Movement

Element 11 Barriers to aquatic species movement scoring matrix

No artificial barriers that prohibit movement of aquatic organisms during any time of the year	Physical structures, water withdrawals and/ or water quality season-ally restrict movement of aquatic species			Physical structures, water withdrawals and/ or water quality restrict movement of aquatic species throughout the year				Physical structures, water withdrawals and/ or water quality prohibit movement of aquatic species		
10	9	8	7	6	5	4	3	2	1	0



Element 12 - Fish Habitat Complexity

Element 12 Fish habitat complexity scoring matrix

Ten or more habitat features available, at least one of which is considered optimal in reference sites (large wood in forested streams)		Eight to nine habitat features available		Six to seven habitat features available		Four to five habitat features available		Less than four habitat features available	
10	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**

Note: Fish habitat features: logs/large wood, deep pools, other pools (scour, plunge, shallow, pocket) overhanging vegetation, boulders, cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, backwater pools, and other off-channel habitats

Element 13 – Aquatic Invertebrate Habitat

Element 13 Aquatic invertebrate habitat scoring matrix

At least 9 types of habitat present A combination of wood with riffles should be present and suitable in addition to other types of habitat (If nonforested stream, consider reference site's optimal habitat type needed for this high score)	8 to 6 types of habitat Site may be in need of more wood or reference habitat features and stable wood-riffle sections	5 to 4 types of habitat present	3 to 2 types of habitat present	None to 1 type of habitat present
10 9	**8 7 6**	**5 4**	**3 2**	**1 0**

Note: Aquatic invertebrate habitat types, in order of importance: Logs/large wood, cobble within riffles, boulders within riffles. Additional habitat features should include: leaf packs, fine woody debris, overhanging vegetation, aquatic vegetation, undercut banks, pools, and root mats.

Element 14 – Aquatic Invertebrate Community

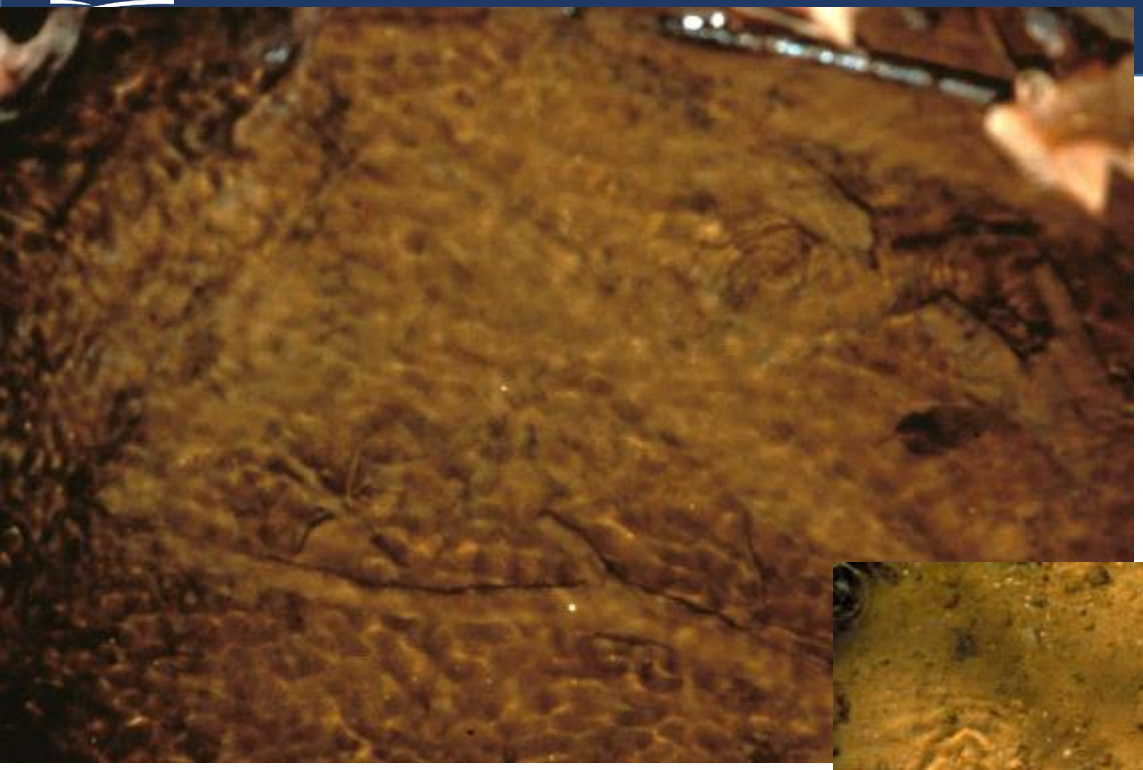
Element 14 Aquatic invertebrate community scoring matrix

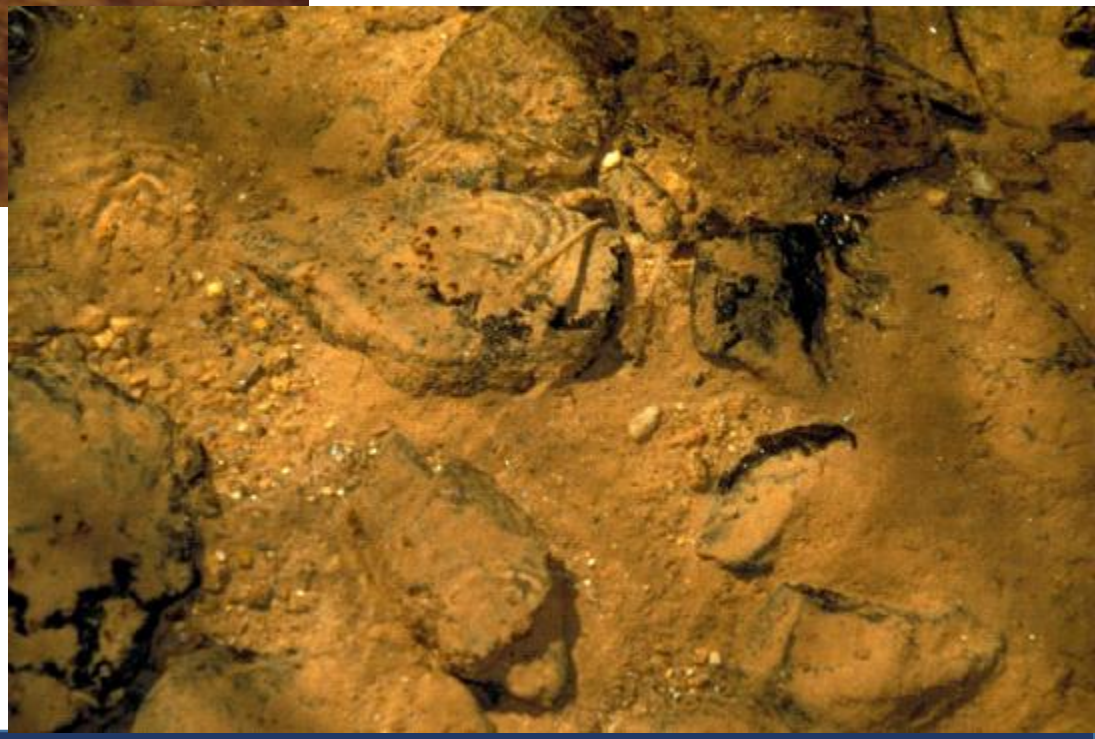
Invertebrate community is diverse and well represented by group I or intolerant species One or two species do not dominate			Invertebrate community is well represented by group II or facultative species, and group I species are also present One or two species do not dominate			Invertebrate community is composed mainly of groups II and III **and/or** One or two species of any group may dominate			Invertebrate community composition is predominantly group III species **and/or** only one or two species of any group is present and abundance is low	
10	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**

Element 15 - Riffle Embeddedness

Element 15 Riffle embeddedness scoring matrix

Gravel or cobble substrates are <10% embedded		Gravel or cobble substrates are 10–20% embedded		Gravel or cobble substrates are 21–30% embedded		Gravel or cobble substrates are 31–0% embedded		Gravel or cobble substrates are >40% embedded		
10	9	8	7	6	5	4	3	2	1	0





Element 16 - Salinity

Element 16 Salinity scoring matrix

No wilting, bleaching, leaf burn, or stunting of riparian vegetation No streamside salt-tolerant vegetation present			Minimal wilting, bleaching, leaf burn, or stunting of riparian vegetation Some salt-tolerant streamside vegetation			Riparian vegetation may show significant wilting, bleaching, leaf burn, or stunting Dominance of salt-tolerant streamside vegetation		Severe wilting, bleaching, leaf burn, or stunting; presence of only salt tolerant riparian vegetation Most streamside vegetation is salt tolerant			
10	9	8	7	6	5	4	3	2	1	0	

Note: Do not assess this element unless elevated salinity levels caused by people are suspected.

Summary

- stream reach
- maximum 16 elements; use only applicable ones
- assign rating for each element
- calculate overall score
- determine narrative rating
- potential causes and recommendations

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