

Stream Visual Assessment Protocol
Visual Assessment Score (VAS)
Natural Resource Conservation Service

Assessment protocol provides a basic level of stream health evaluation based primarily on physical conditions within the assessment area. The protocol calculates a Visual Assessment Score (VAS) based on the following.

Assessment protocol consists of two sections:

1. Reach identification
2. Assessment (up to 15 assessment elements)
 - Channel condition.
 - Hydrologic alteration.
 - Riparian zone.
 - Bank stability.
 - Water appearance
 - Nutrient enrichment
 - Barriers to fish movement
 - Instream fish cover
 - Pools
 - Invertebrate habitat
 - Canopy cover
 - Manure presence
 - Salinity
 - Riffle embeddedness
 - Macroinvertebrates observed

Overall assessment score is determined by adding the values for each element and dividing by the number of elements assessed.

High values indicate good to excellent stream condition
Low VAS values indicate poor stream condition.

<u>Visual Assessment Score</u>	<u>Stream Condition</u>
> 9.0	Excellent
8.9-7.5	Good
7.4-6.1	Fair
<6.0	Poor

Use of the Visual Assessment provides a numerical assessment of the environmental condition of the stream reach evaluated. This value can be used as a general statement about the “state of the environment” of the stream (over time) or as an indicator of trends in condition.

It could be used of deciding which streams or which watershed require more detailed stream analysis.



Stream Visual Assessment Protocol

8:35
5/10/10

Owners name _____ Evaluator's name _____ Date 5/17/10

Stream name HAWKAS CREEK Waterbody ID number 7

Reach location JUST WEST OF PEBBLE BEACH RD CROSSING

Ecoregion _____ Drainage area _____ Gradient _____

Applicable reference site _____

Land use within drainage (%): row crop _____ hayland _____ grazing/pasture _____ forest _____ residential _____

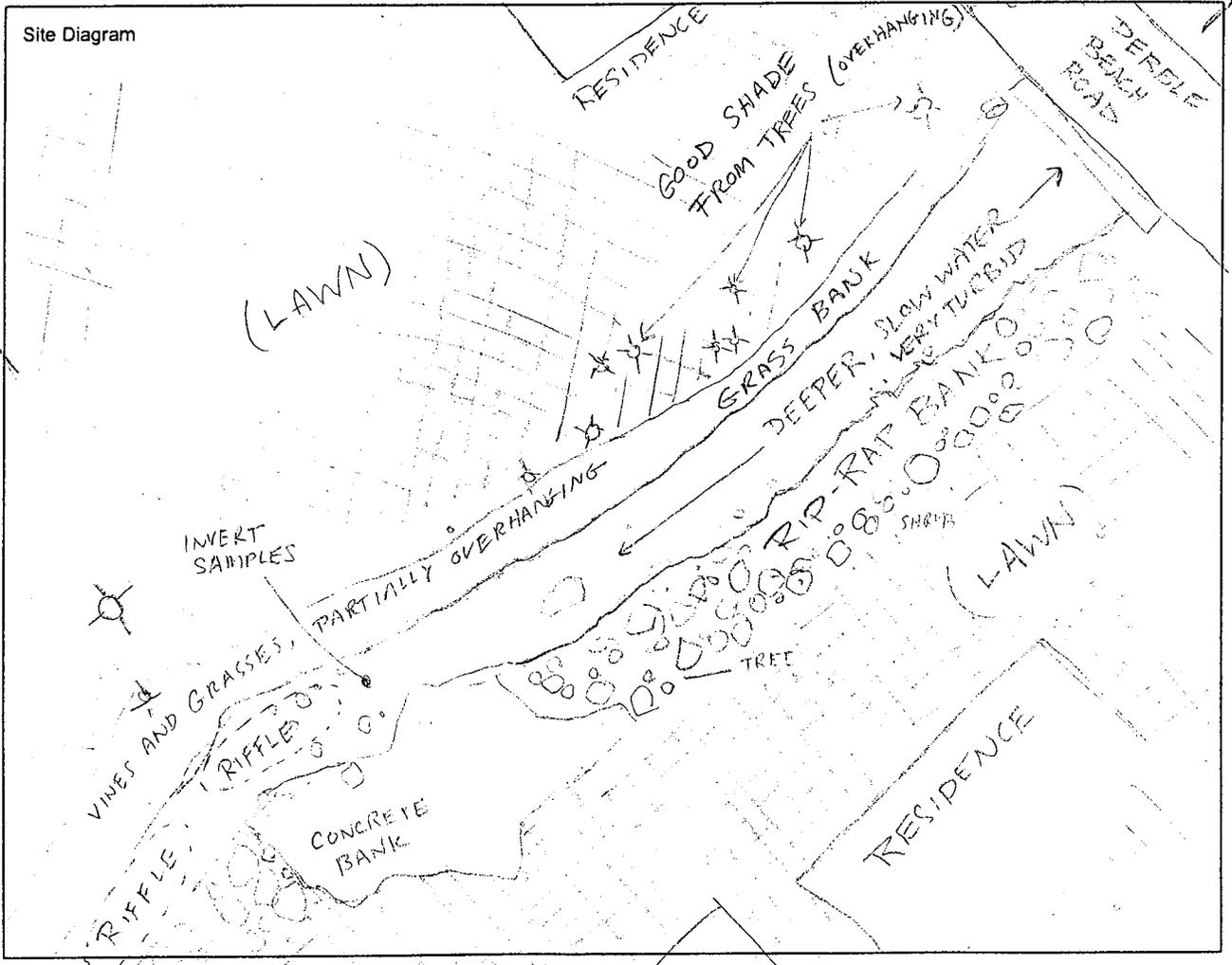
confined animal feeding operations _____ Cons. Reserve _____ industrial _____ Other: _____

Weather conditions-today Sunny Past 2-5 days 2" rain 3 days ago

Active channel width 5 FEET Dominant substrate: boulder 10% gravel 10% sand _____ silt _____ mud _____

COBBLE 40%

(~150' TO LAKE)



Assessment Scores

Channel condition	<input type="text" value="2"/>	Pools	<input type="text" value="2"/>
Hydrologic alteration	<input type="text" value="3"/>	Invertebrate habitat	<input type="text" value="6"/>
Riparian zone	<input type="text" value="3"/>	Score only if applicable	
Bank stability	<input type="text" value="7"/>	Canopy cover	<input type="text" value="3"/>
Water appearance	<input type="text" value="7"/>	Manure presence	<input type="text" value="NA"/>
Nutrient enrichment	<input type="text" value="5"/>	Salinity	<input type="text" value="5"/> (0.4%)
Barriers to fish movement	<input type="text" value="10"/>	Riffle embeddedness	<input type="text" value="8"/>
Instream fish cover	<input type="text" value="5"/>	Macroinvertebrates Observed (optional)	<input type="text" value="8"/> (74)

Overall score (Total divided by number scored)	<u>5.3</u>	<6.0	Poor
		6.1-7.4	Fair
		7.5-8.9	Good
		>9.0	Excellent

Suspected causes of observed problems RIP-RAP EMBANKMENT AND CONCRETE-LINED BANK REDUCE SUITABLE HABITAT. LAWNS ON EITHER SIDE ALSO ENCRACH ON RIPARIAN CORRIDOR, REDUCING SHADE AND HABITAT. SIGNIFICANT UPSTREAM IMPACTS RESULT FROM D.O.T. STATION, ROADS, AND DEVELOPMENT.

Recommendations REPLACE RIP-RAP WITH MORE VARIED- AND VEGETATED EMBANKMENT. RECOMMEND SET-BACK OF LAWNS AND RESIDENTIAL ACTIVITY FROM STREAM. INVESTIGATE UPSTREAM NUTRIENT INPUTS FROM SOURCES MENTIONED ABOVE.

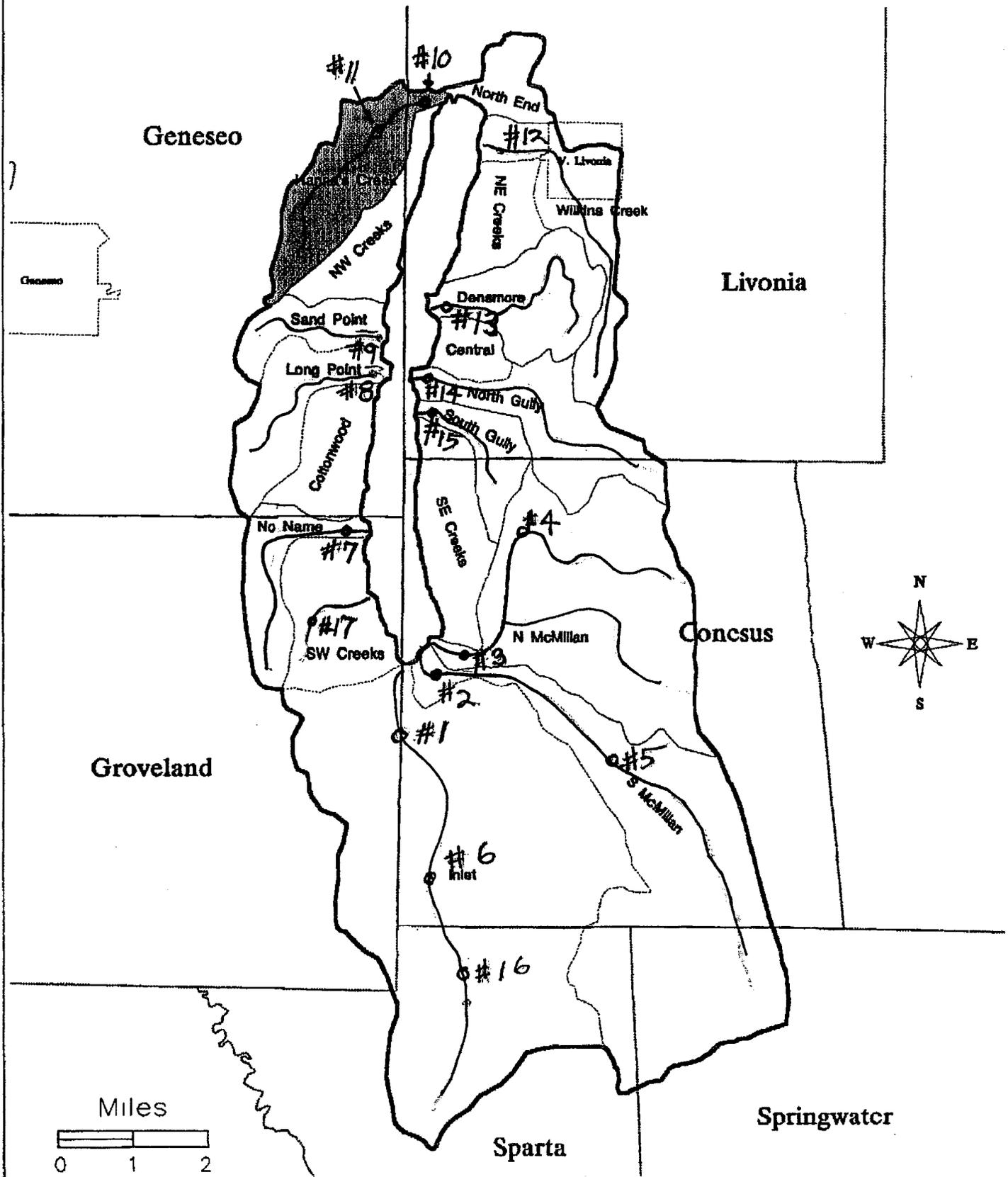
Observed Problems and Recommended Solutions Regarding Tributaries of Conesus Lake
 May 16-17, 2000

Tributary	Location	Problems observed	Recommended solutions
Inlet	Downstream (Station 1)	<ul style="list-style-type: none"> Hydrologic alterations (pipe and dike control water flow from wetland) Possibility of nutrient enrichment from upstream septic systems 	<ul style="list-style-type: none"> Hydrology controlled by NYDEC for habitat reasons; no change recommended Assess upstream septic systems
	Mid-stream (Station 6)	<ul style="list-style-type: none"> Some bank erosion Agricultural activity nearby, separated from stream by riparian buffer Some invasive plants present (Japanese knotweed) 	<ul style="list-style-type: none"> Bank stabilization recommended Maintenance or enlargement of agricultural setback Remove or reduce invasive species
	Upstream (Station 16)	<ul style="list-style-type: none"> Severe bank erosion on both sides Lawn encroaches on riparian corridor Sediment loading apparent in stream 	<ul style="list-style-type: none"> Bank stabilization recommended Set back lawn from stream edge Investigate upstream causes for suspended solids in stream
South McMillan	Downstream (Station 2)	<ul style="list-style-type: none"> Rip-rap on east bank Possible enrichment from nearby septic systems and upstream agriculture Lawns continue to stream's edge Foam visible on water surface 	<ul style="list-style-type: none"> Replace rip-rap with more natural stabilization methods (i.e. native vegetation) Investigate septic tanks and agricultural runoff upstream Restore native vegetation buffer in riparian zone Test for detergents
	Upstream (Station 5)	<ul style="list-style-type: none"> Some bank erosion and small bank failure near bridge Some disturbances to site, including gravel pile on roadside and wooden box on bank 	<ul style="list-style-type: none"> Bank stabilization recommended, especially near bridge Removal or further setback of gravel pile recommended

North McMillan	Downstream (Station 3)	<ul style="list-style-type: none"> • Some encroachment of lawn on south side • Salt storage and agricultural activity upstream of site • Bank erosion upstream of site 	<ul style="list-style-type: none"> • Set back lawn and restore riparian vegetation buffer • Investigate salt and nutrient inputs upstream • Bank stabilization recommended
	Upstream (Station 4)	<ul style="list-style-type: none"> • Lawn close to north bank • Fish passage obstacle just downstream of bridge (log-pile dam) 	<ul style="list-style-type: none"> • Set back lawn and restore riparian vegetation buffer • Remove dam
No Name Creek	Downstream (Station 7)	<ul style="list-style-type: none"> • Incised streambed • Concrete streambanks near bridge 	<ul style="list-style-type: none"> • Bank and streambed restoration (including removal of concrete) recommended to stabilize banks and to provide better in-stream habitat
	Downstream (Station 8)	<ul style="list-style-type: none"> • Bank erosion and concrete lining near culvert • Sediment deposition • tolerant invertebrate population suggests nutrient loading upstream 	<ul style="list-style-type: none"> • Bank stabilization and removal or reduction of concrete substrate near bridge recommended • Investigate causes of suspended solids loading • Investigate nutrient inputs upstream of site.
Sandpoint Gully	Downstream (Station 9)	<ul style="list-style-type: none"> • Incised streambed and bank erosion, partially due to undersized box culvert and channelized section under bridge 	<ul style="list-style-type: none"> • Bank stabilization recommended • Replacement of culvert and restoration of streambed to natural substrate recommended
	Downstream (Station 10)	<ul style="list-style-type: none"> • Rip-rap on south bank • Lawns continue to streambank • Nutrient enrichment from upstream 	<ul style="list-style-type: none"> • Replace rip-rap with more natural stabilization methods • Restore riparian buffer • Investigate upstream nutrient loading
Hanna's Creek	Upstream (Station 11)	<ul style="list-style-type: none"> • Extensive macrophyte growth in stream possibly due to agricultural impacts upstream • Traces of oil and discoloration in water (possibly tannic acid from wetland upstream and oil from the nearby road) 	<ul style="list-style-type: none"> • Investigate upstream impacts by agriculture, roads, and wetland

Wilkin's Creek	Downstream (Station 12)	<ul style="list-style-type: none"> • Some bank erosion • Lawn close to north bank • Possible nutrient loading from upstream development (Lavonia) 	<ul style="list-style-type: none"> • Bank stabilization recommended • Set back lawn from stream edge and restore buffer • Assess upstream nutrient impacts from Lavonia
Densmore Creek	Downstream (Station 13)	<ul style="list-style-type: none"> • Severe erosion on north bank • Rip-rap stabilization on south • Lawns/grass encroachment on riparian corridor on both sides 	<ul style="list-style-type: none"> • Bank stabilization recommended on north side • Replace rip rap with more natural stabilization methods (i.e. native vegetation) • Set back lawns and restore riparian buffer
North Gully	Downstream (Station 14)	<ul style="list-style-type: none"> • Severe erosion on both banks • Lawns encroachment on north side • Sediment loading apparent 	<ul style="list-style-type: none"> • Bank stabilization and revegetation • Setback of lawn from streambank • Investigate upstream causes of sediment loading
South Gully	Downstream (Station 15)	<ul style="list-style-type: none"> • Erosion on north bank • Lawn encroachments on north side • Some sediment loading 	<ul style="list-style-type: none"> • Bank stabilization • Setback of lawn from north bank • Investigate upstream causes of sediment loading
Southwest creek	Upstream (Station 17)	<ul style="list-style-type: none"> • Extensive macrophyte growth in stream probably due to nutrient loading from livestock just upstream • Sediment loading from same source • Lack of riparian vegetation 	<ul style="list-style-type: none"> • Setback of cattle from stream recommended • Restore natural riparian vegetation along reach and in livestock-impacted area upstream

Conesus Lake Watershed and Sub-Watersheds



**Tributary characterization for Conesus Lake, 16-17 May, 2000
Family-level biotic index (FBI) (Sorted in descending order)**

Stream	#	Location	Site #	FBI	Rating	Taxa	EPT	%EPT
Inlet	1	dstream	1	7.14	Poor	7	2	29
Southwest Creek	12	upstream	17	6.49	Fairly Poor	3	0	0
Inlet	1	middle	6	6.1	Fairly Poor	13	8	62
Long Point	5	dstream	8	4.88	Good	6	3	50
Wilkin's Creek	8	dstream	12	4.71	Good	5	2	40
Hanna's Creek	7	dstream	10	4.64	Good	5	2	40
No Name	4	dstream	7	4.55	Good	8	6	75
Hanna's Creek	7	upstream	11	3.33	Excellent	5	3	60
Densmore Creek	9	dstream	13	3.11	Excellent	9	6	67
North Gully	10	dstream	14	2.7	Excellent	7	7	100
South Gully	11	dstream	15	2.5	Excellent	10	8	80
Inlet	1	upstream	16	2.48	Excellent	9	8	89
S. McMillan	2	upstream	5	2.46	Excellent	12	10	83
Sandpoint Gully	6	dstream	9	2.2	Excellent	3	3	100
N. McMillan	3	dstream	3	2.13	Excellent	11	10	91
N. McMillan	3	upstream	4	1.91	Excellent	12	8	67
S. McMillan	2	dstream	2	1.59	Excellent	8	6	75

KEY: #= stream number; **site #=** chronological by sample; **FBI=** Filed Biotic Index;

%EPT= % of sample in Ephemeroptera, Plecoptera, Tricoptera (sensitive organisms);

VAS= Visual assessment; **Dchg=** Discharge; **TP=** Total Phosphorus; **TSS=** Total suspended solids; **TKN=** Total Kjeldahl Nitrogen

Tributary Characterization for Conesus Lake, May 16-17, 2000
 Visual Assessment Scores

Stream	#	Location	Site #	CC	HA	RZ	BS	WA	NE	BTF	IFC	Pis	IH	Can	MP	Sal	RE	Invert	subtotal	SCORE	RATING
Southwest Creek	12	upstream	17	7	7	9	5	2	2	9	5	1	6	3	3	5	1	1	66	4.4	poor
Long Point	5	dstream	8	3	7	8	4	6	7	6	3	3	10	5	NA	5	3	4	74	5.3	poor
Hanna's Creek	7	dstream	10	2	3	3	7	7	5	10	5	2	6	3	NA	5	8	8	74	5.3	poor
No Name	4	dstream	7	3	3	8	3	7	7	8	5	1	7	7	NA	5	5	6	75	5.4	poor
S. McMillian	2	dstream	2	3	3	3	3	7	7	10	3	1	7	3	NA	5	9	15	79	5.6	poor
Densmore Creek	9	dstream	13	2	6	2	7	7	3	10	3	1	7	3	NA	5	8	15	79	5.6	poor
Sandpoint Gulley	6	dstream	9	4	3	5	1	7	7	5	8	3	10	7	NA	5	3	15	83	5.9	poor
Wilkin's Creek	8	dstream	12	9	8	3	7	9	7	8	4	2	10	4	NA	5	3	6	85	6.1	fair
Inlet	1	dstream	1	8	2	9	9	7	4	6	10	7	8	9	NA	5	5	2	91	6.5	fair
South Gulley	11	dstream	15	8	7	4	2	7	9	9	5	2	10	10	NA	5	4	15	97	6.9	fair
North Gulley	10	dstream	14	7	7	3	4	5	8	10	8	3	10	10	NA	5	7	15	102	7.3	fair
Inlet	1	upstream	16	7	5	5	3	7	10	10	8	7	10	7	NA	5	5	15	104	7.4	fair
N. McMillian	3	upstream	4	7	5	9	7	7	7	4	5	3	10	10	NA	5	10	15	104	7.4	fair
S. McMillian	2	upstream	5	7	9	10	7	8	6	9	3	3	8	10	NA	5	5	15	105	7.5	good
N. McMillian	3	dstream	3	8	7	5	4	7	9	10	5	1	10	10	NA	5	9	15	105	7.5	good
Hanna's Creek	7	upstream	11	8	9	10	8	7	4	10	8	1	10	9	5	5	8	15	117	7.8	good
Inlet	1	middle	6	9	9	9	7	8	8	10	8	3	9	10	NA	5	9	6	110	7.9	good

KEY: #= stream number; site #= chronological by sample; CC= channel condition; HA= Hydrologic alteration; RZ= Riparian zone; BS= Bank stability; WA= water appearance; NE=Nutrient enrichment; BTF= Barrier to fish movement; IFC= Instream fish cover; Pis= Pools; IH= Invertebrate habitat; Can= Canopy cover; MP= Manure presence (NA= presence or absence of manure unknown); Sal= Salinity; RE= Riffle embeddedness; Invert= Macroinvertebrate presence; SCORE= Total VAS score

Tributary characterization for Conesus Lake, May 16-17, 2000
 Field Biotic Index, Visual Assessment, and Water Quality Indicators

Stream	#	Location	Site #	FBI	Rating	Taxa	EPT	%EPT	VAS	Rating	DO	% Sat.	Cond	pH	Temp	Ha	Unit Loads (g/ha/d)*					Estimated Annual Loads (kg/yr)																					
																	Dchg (mg/d)	TP (kgP/d)	TKN (kgN/d)	NO3 (kgN/d)	TSS (kg/d)	Dchg (10 ³ mg/yr)	TP	TKN	NO3	TSS																	
Inlet	1	dstream	1	7.14	Poor	7	2	29	6.2	fair	5.81	59	264.7	7.3	15.9	4475.0	22751	0.13	3.66	4.50	62	8304.1	204.4	597.4	7351.1	101835.0																	
Inlet	1	middle	6	6.1	Fairly Poor	13	8	62	7.9	good	9.93	92.7	347.3	8.3	14.7	4475.0	22751	0.13	3.66	4.50	62	8304.1	204.4	597.4	7351.1	101835.0																	
Inlet	1	upstream	16	2.48	Excellent	9	8	89	7.4	fair	9.23	95.2	372.1	8.3	17.4	4475.0	22751	0.13	3.66	4.50	62	8304.1	204.4	597.4	7351.1	101835.0																	
South McMillan	2	dstream	2	1.59	Excellent	8	6	75	5.6	poor	9.97	94.2	147.3	7.9	12.6	2687.5	36389	0.48	4.16	3.99	312	13282.0	470.9	4084.4	3916.5	306235.0																	
South McMillan	2	upstream	5	2.46	Excellent	12	10	83	7.5	good	9.87	92.6	143	7.8	15	2887.5	36389	0.48	4.16	3.99	312	13282.0	470.9	4084.4	3916.5	306235.0																	
North McMillan	3	dstream	3	2.13	Excellent	11	10	91	7.5	good	10.55	96.6	321.4	8.4	12.6	2045.0	45297	0.43	5.64	9.52	277	16533.4	322.5	4208.5	7106.6	206590.0																	
North McMillan	3	upstream	4	1.91	Excellent	12	8	67	7.3	fair	10.13	97.7	216.3	7.8	13	2045.0	45297	0.43	5.64	9.52	277	16533.4	322.5	4208.5	7106.6	206590.0																	
No Name	4	dstream	7	4.55	Good	8	6	75	5.4	poor	10.48	97.7	466	8.3	12.4	415.0	2892	0.52	4.16	29.52	88	1055.6	78.8	630.1	4471.3	13329.8																	
Long Point	5	dstream	8	4.88	Good	6	3	50	5.4	poor	10.04	96.2	524	8.5	12.9	622.5	5761	0.49	4.90	38.32	41	2102.8	111.3	1113.3	8706.8	9315.7																	
Sandpoint Gully	6	dstream	9	2.2	Excellent	3	3	100	5.9	poor	9.00	86.2	205.1	8.3	12.6	325.0	922	0.10	1.30	4.18	14	336.5	11.9	154.2	496.4	1660.8																	
Hanna's Creek	7	upstream	10	4.64	Good	5	2	40	5.3	poor	9.70	91.7	576	8.3	12.7	717.5	14365	1.16	10.15	15.07	122	5243.2	303.0	2657.2	3945.7	31950.3																	
Hanna's Creek	7	dstream	11	3.33	Excellent	5	3	60	7.8	good	9.30	90.5	529	8.3	15.1	717.5	14365	1.16	10.15	15.07	122	5243.2	303.0	2657.2	3945.7	31950.3																	
Willitt's Creek	8	dstream	12	4.71	Good	5	2	40	6.1	fair	11.10	97.2	715	8.9	14	690.0	8836	0.36	3.78	4.88	146	2130.1	91.3	952.7	1229.0	36865.0																	
Densmore Creek	9	dstream	13	3.11	Excellent	9	6	67	5.6	poor	10.90	99.3	622	8.5	14.5	647.5	5374	0.23	2.72	4.87	53	1961.5	54.8	642.4	1151.0	12410.0																	
North Gully	10	dstream	14	2.7	Excellent	7	7	100	7.4	fair	9.73	97.4	463	8.5	15.2	735.0	7768	0.79	3.69	8.75	205	2835.3	211.7	989.2	2347.0	55115.0																	
South Gully	11	dstream	15	2.5	Excellent	10	8	80	6.9	fair	8.70	84.5	491	8.3	15.1	345.0	3817	0.39	3.29	13.20	137	1393.2	49.1	414.3	1662.2	17251.7																	
Southwest Creek	12	upstream	17	6.49	Fairly Poor	3	0	0	4.4	poor	7.57	81.5	627	8	17.8																												
TOTALS:																28105.0	151172	5.08	47.44	136.80	1458	55177.78	1909.5	21817.5	42383.3	792558.3																	

KEY: # = stream number; site # = chronological by sample; FBI = Field Biotic Index; %EPT = % of sample in Ephemeroptera, Plecoptera, Tricoptera (sensitive organisms);
 VAS = Visual assessment; Dchg = Stream discharge; DO = dissolved oxygen; %Sat = Percent oxygen saturation; Cond = conductivity; Ha = Area of watershed in hectares; TP = Total Phosphorus;
 TSS = Total suspended solids; TKN = Total Kjeldahl Nitrogen
 * Data from "Chemical analysis and nutrient loading of streams entering Conesus Lake, NY." Joseph C. Makarewicz, Theodore W. Lewis, Ronald Dlicher, Michael Letson, and Norma Puckett, pp. 54-55, 1991.

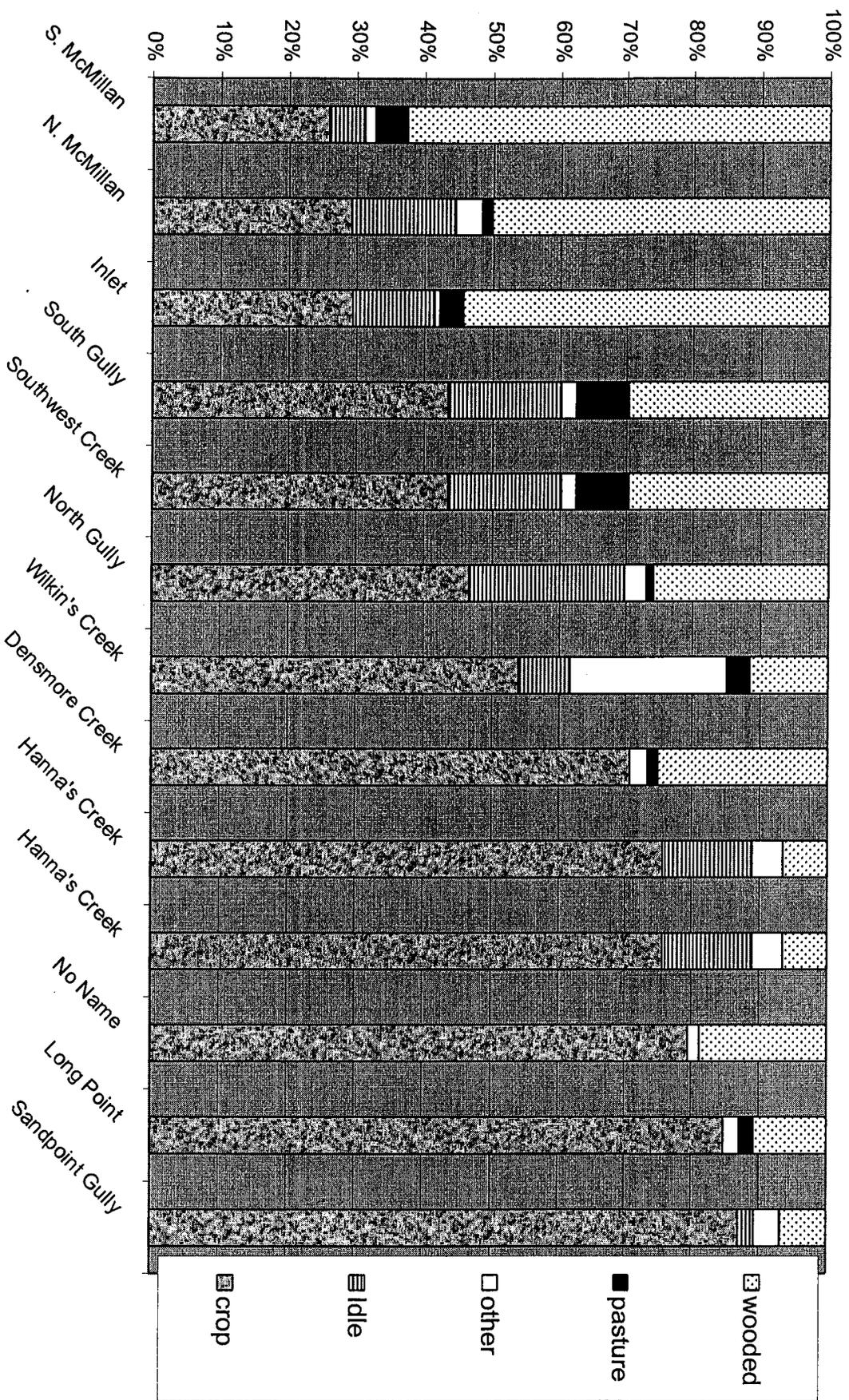
Tributary characterization for Conesus Lake, May 16-17, 2000
 Land Use in Watersheds

Stream	#	Location	Site #	FBI	Rating	VAS	Rating	Land Use by Percent*							Total Ha
								crop	idle	other	pasture	wooded			
Inlet	1	dstream	1	7.14	Poor	6.2	fair	29.4	12.0	0.8	3.4	54.4	4475		
Inlet	1	middle	6	6.1	Fairly Poor	7.9	good	29.4	12.0	0.8	3.4	54.4	4475		
Inlet	1	upstream	16	2.48	Excellent	7.4	fair	29.4	12.0	0.8	3.4	54.4	4475		
S. McMillan	2	dstream	2	1.59	Excellent	5.6	poor	25.9	5.2	1.6	4.7	62.7	2687.5		
S. McMillan	2	upstream	5	2.46	Excellent	7.5	good	25.9	5.2	1.6	4.7	62.7	2687.5		
N. McMillan	3	dstream	3	2.13	Excellent	7.5	good	29.2	15.2	3.9	1.5	50.2	2045		
N. McMillan	3	upstream	4	1.91	Excellent	7.3	fair	29.2	15.2	3.9	1.5	50.2	2045		
No Name	4	dstream	7	4.55	Good	5.4	poor	79.5	0.0	1.8	0.0	18.7	415		
Long Point	5	dstream	8	4.88	Good	5.4	poor	84.7	0.0	2.4	2.0	10.8	622.5		
Sandpoint Gully	6	dstream	9	2.2	Excellent	5.9	poor	86.9	2.3	3.8	0.0	6.9	325		
Hanna's Creek	7	dstream	10	4.64	Good	5.3	poor	75.6	13.2	4.5	0.0	6.6	717.5		
Hanna's Creek	7	upstream	11	3.33	Excellent	7.8	good	75.6	13.2	4.5	0.0	6.6	717.5		
Wilkin's Creek	8	dstream	12	4.71	Good	6.1	fair	54.0	7.6	23.6	3.3	11.6	690		
Densmore Creek	9	dstream	13	3.11	Excellent	5.6	poor	70.7	0.0	2.7	1.5	25.1	647.5		
North Gully	10	dstream	14	2.7	Excellent	7.4	fair	46.6	23.1	3.4	1.0	25.9	735		
South Gully	11	dstream	15	2.5	Excellent	6.9	fair	43.5	16.7	2.2	8.0	29.7	345		
Southwest Creek	12	upstream	17	6.49	Fairly Poor	4.4	poor	43.5	16.7	2.2	8.0	29.7	345		

KEY: # = stream number; site # = chronological by sample; FBI = Field Biological Index; VAS = Visual assessment;

* "Chemical analysis and nutrient loading of streams entering Conesus Lake, NY." Joseph C. Makarewicz, Theodore W. Lewis, Ronald Dichter, Michael Letson, and Norma Puckett, p. 63, 1991.

Land Use



Conesus Lake Tributaries: FBI, VAS, Discharge, and Total Phosphorus, by Stream

