



FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION STRATEGIC MONITORING PROGRAM FIELD SHEET

January 2018

Data Qualified?

Yes / No

WIN Station Name: Cow Creek @ 75m E of Deep Creek

Date: 02/27/2018
(mm/dd/yyyy)

WIN/ Field ID: G2CE0172

WBID: 2952

Latitude: 28.81266

County: Volusia

ORG ID: 21 FL CEN

Longitude: -81.05407
(Decimal Degrees)

Receiving Body of Water: _____

RQ-2018- 02-26-68

Sampling Team Members						WQ Measurements	Sample Collection	Documentation	Preservation	Preservation Check
Mike Linger										
Mike Drannan										

Sampling Equipment				
☒ Sample Container	☐ Van Dorn	☐ Pole		
☐ Carboy	☒ Syringe			
☐ Dipper	☐ Other			
Depth Measured with <u>SECCHI DISK LINE</u>				
Equipment ID _____				

Collection Method				
☒ Wading	☐ Canoe/Kayak			
☐ From Shore	☐ Electric Motor			
☐ Other	☐ Gasoline Motor			

Water Level: Dry / Pooled / Low / <u>Normal</u> / High / Flooded					Meter ID# <u>Boop/nor</u>					Matrix: <u>Fresh</u> / Marine / DI									
Photos: Yes / <u>No</u>					Flow: No Flow / Intestinal / <u>Flowing</u> / NA					Tide: Rising / Falling / Slack / <u>NA</u>					Tide Times: High _____ Low _____				
Time Zone	Time	Total Depth (m)	Sample Depth (m)	Secchi Disk (m)	DO (mg/L)	DO (%SAT)	pH	Salinity (PPT)	Sp COND (µmhos/cm)	Temp. (C°)									
<u>EST</u>	<u>1356</u>	<u>0.6</u>	<u>0.3</u>	<u>0.3</u>	<u>3.32</u>	<u>38.7</u>	<u>4.63</u>	<u>0.09</u>	<u>187</u>	<u>23.13</u>									
CEN				<u>0.3</u>															

Biological Samples Collected: None <u>HA</u> <u>SCI</u> <u>RPS</u> Algae ID <u>LVS</u> LVI Other: _____									
SBIO ID Numbers: SBIO-ID: <u>78260</u> HA-ID: <u>78260504</u> RPS-ID: <u>8938</u> Macrophyte-ID: <u>10851</u> LIMS#: <u>1970581</u>									
Parameter Suite	Parameter Methods					Preservation	Lot#	Expiration	pH Check
Preserved Nutrients	☒ W-NH3 / W-NO2NO3 / W-TKN / W-TOC / W-S-A-TP					☒ Ice ☒ H2SO4	<u>SA7341020</u>	<u>12/7/18</u>	☒ <2
Metals	☒ W-ICPMS ☒ W-ICP					☒ Ice ☒ HNO3	<u>7086060</u>	<u>3/27/18</u>	☒ <2
Filtered Nutrients	☒ W-PO4-F ☒ Field Filtered 0.45 µm Filter					☒ Ice	<u>13615055</u>		
Chlorophyll	☒ CHLSUITE-W					☒ Ice			
Physical/Aggregate (Fresh)	☒ Alkalinity / W-F / W-TSS / TURBIDITY / W-Cl-IC / W-COLOR / W-SO4-IC / W-TDS					☒ Ice			
Physical/Aggregate (Marine)	☐ Alkalinity / W-F / W-TSS / TURBIDITY					☐ Ice			
Macroinvertebrates	☐ MI-FW-QLDC					☐ Formalin			
Periphyton	☐ ALGAE-ID					☐ Ice			
Microbiology	☒ E Coli ☐ F Coli ☐ Enterococci					☒ Ice			
Molecular	☐ PCR-FILTER ☐ PCR-HF183 ☐ PCR-BacR ☐ PCR-GULL2 ☐ PCR-GFD					☐ Ice			
Tracers	☐ W-SUC-AA-R ☐ W-UHERB-AA ☐ W-AHERB-AA					☐ Ice			
Pesticides	☐ W-PSNP-TQ ☐ W-UHERB-AA ☐ W-AHERB-AA ☐ W-CARB-AA ☐ W-PCL-SQ-R ☐ W-PYR-AA-R ☐ W-GLYPH ☐ W-SUC-AA-R					☐ Ice ☐ Other			

Notes:

WIN ID / Field ID →

Cow Creek @ 75m E of
Deep Creek
(2952)



G2CE0172

Signature: [Signature]

Date: 3/5/18

Enter Field Parameters, Verify Station ID In LIMS DMT: LMD 3/15/18

QC Station ID, Field Parameters In LIMS DMT: AKL 3/20/18

Scan/Save Field Sheets _____
(Initials/Date)

Migrate Data to WIN: _____
(Initials/Date)

Verify Data in WIN: _____
(Initials/Date)

(Initials/Date)

DEP Form FD 9000-3 Physical/Chemical Characterization Field Sheet

SAMPLE ID 78260 ORG ID 21FLCCN LATITUDE 28.81266
 COUNTY Volusia STORET # 62CE0172 LONGITUDE -81.05407
 DATE 2/27/18 TIME 1356 SAMPLING AGENCY FDEP-CEROL
 SITE NAME Cow Creek @ 75m E of Deep Creek
 FIELD ID/NAME 62CE0172 RECEIVING BODY OF WATER Deep Creek

RIPARIAN ZONE / STREAM FEATURES

PREDOMINANT LAND-USE IN WATERSHED (specify relative percent in each category): Forest/Natural ☐ Silviculture ☐ Field/Pasture ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industry ☐ Other (Specify) ☐ <u>100</u> ☐ ☐ ☐ ☐ ☐ ☐ ☐								Landscape Development Intensity Index (LDI) ☐	
Local Watershed Erosion (select one): ☒ None ☐ Slight ☐ Moderate ☐ Heavy Local Watershed NPS Pollution: ☒ No evidence ☐ Slight ☐ Moderate ☐ Heavy						Typical Width (m) Depth (m)/Velocity (m/sec) Transect ☐ m/s <u>0.09</u> m/s ☐ m/s 5m - 10m E. 6m			
Width of Riparian Vegetation (m) on Each Buffer Side Left Bank: <u>718</u> Right Bank: <u>718</u>				Hydrologic Modification Score (per FT 3101) ☐					
High Water Mark: <u>0.5</u> + <u>0.6</u> * = <u>1.1</u> (m) (above present water level) (present depth) (above bed)				Artificially Impounded ☐ Yes ☒ No					
Artificially ☒ No ☐ Mostly recovered, more sinuous Channelized: ☐ Some recovery ☐ Recent, severe				Canopy Cover % ☐ Open ☒ Lightly Shaded (11-45%) ☐ Heavily Shaded ☐ Moderate Shaded (46-80%)					

SEDIMENT / SUBSTRATE

sediment type: Organic Fibrous

Sediment Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse			Sediment Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ Other (Specify):			Smothering of Substrates Sand Smothering: None ☒ Slight ☐ Moderate ☐ Severe ☐ Silt Smothering: None ☐ Slight ☐ Moderate ☒ Severe ☐ Algae Smothering: None ☒ Slight ☐ Moderate ☐ Severe ☐		
SUBSTRATE TYPE Assessment Tool: ☒ SCI ☒ RPS ☒ LVS ☐ LCI ☐ BioRecon INVERT PERI % # Times # Times Coverage Sampled Sampled			WATER QUALITY Depth (M) Temp. (°C) pH (SU) D.O. (MG/L) D.O. Sat (%) Cond. (UMHO/CM) Salinity (PPT) SECCHI (M) Top: <u>0.3</u> <u>23.13</u> <u>4.63</u> <u>3.32</u> <u>38.7</u> <u>187</u> <u>0.09</u> <u>0.3</u> Mid: <u>0.6</u> <u>23.13</u> <u>4.63</u> <u>3.32</u> <u>38.7</u> <u>187</u> <u>0.09</u> ☐ VOB Bottom: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Meter ID: <u>BOOP/NON</u> TOTAL DEPTH <u>0.6</u>					
Woody Debris (Snags) <u>5</u> <u>7</u> Undercut Banks / Roots ☐ Leaf Packs or Mat <u>4</u> <u>4</u> Aquatic Vegetation <u>9</u> <u>7</u> Rock or Shell Rubble ☐ Sand ☐ Mud / Muck / Silt ☐ Other <u>Cypress</u> <u>2</u> Other <u>knees</u>			Water Odors Normal ☒ Petroleum ☐ Sewage ☐ Chemical ☐ Other ☐			Water Surface Oils Normal ☒ Sheen ☐ Globbs ☐ Slick ☐ Other ☐		
Water Sample Taken? ☒ Yes ☐ No Sample Preserved? ☒ Yes ☐ No Lot Number: <u>SA7391020</u> Exp: <u>12/7/18</u>			Color Tannic ☒ Green (Algae) ☐ Clear ☐ Other (Specify) ☐			Clarity Clear ☒ Slightly Turbid ☐ Turbid ☐ Opaque ☐		
ABUNDANCE Not Obs. Rare Common Abundant Periphyton: ☐ ☒ ☐ ☐ Fish: ☐ ☐ ☒ ☐ Aquatic Plants: ☐ ☐ ☒ ☐ Iron/Sulfur Bacteria: ☒ ☐ ☐ ☐			System Type: Stream ☒ Lake ☐ Wetland ☐ Estuary ☐ Other (Specify) ☐					
AMBIENT FIELD CONDITIONS / NOTES: 70's scattered clouds, * Typical depth is an average of 3 soundings. * Present depth is from water sampling point. ☒ The antecedent hydrologic conditions have been met to my best knowledge.								

SAMPLING TEAM Mike Linger / Mike Drennan SIGNATURE: [Signature] DATE: 2/27/18

DEP Form FD 9000-5 Stream/River Habitat Assessment Field Sheet

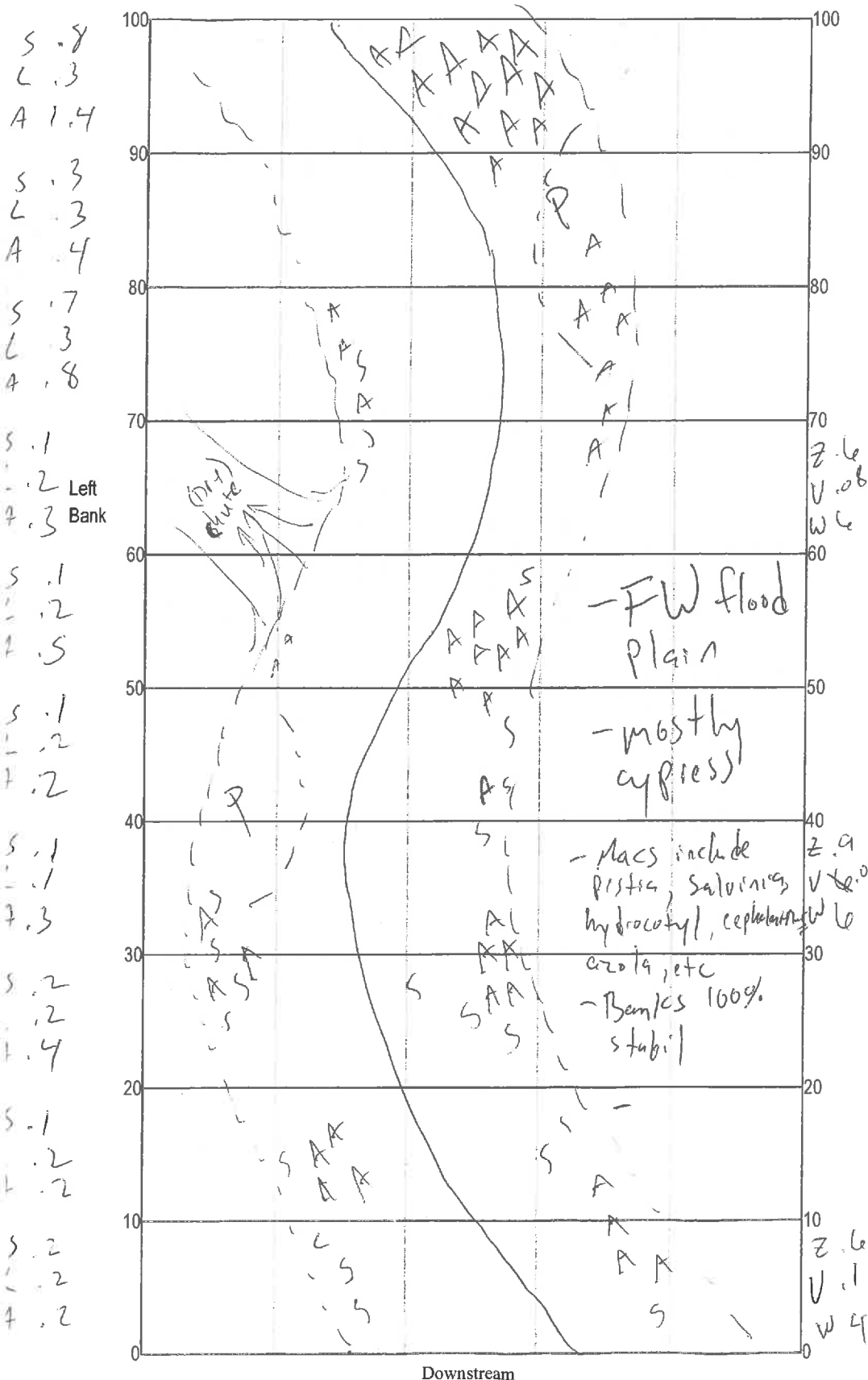
SAMPLING AGENCY: <u>FDEP-CEROC</u>		STORET STATION NUMBER: <u>62CE0172</u>	DATE (MM/DD/YY): <u>2/27/18</u>	RECEIVING BODY OF WATER: <u>Deep Creek</u>
REMARKS:	COUNTY: <u>Volusia</u>	LOCATION: <u>Cow Creek @ 75m E of Deep Creek</u>		FIELD ID/NAME: <u>62CE0172</u>

Habitat Parameter	Optimal	Suboptimal	Marginal	Poor
Primary Habitat Components	Four or more major productive habitats present [snags, tree roots, aquatic vegetation, leaf packs (partially decayed), rock]	Three major productive habitats present. Adequate habitat. Some substrates may be new fall (fresh leaves or snags)	Two major productive habitats present. Less than desirable habitat, frequently disturbed or removed	One or less major productive habitat. Lack of habitat is obvious, substrates unstable or smothered
Substrate Diversity <u>10</u>	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1
Substrate Availability <u>3</u>	Greater than 30% major productive habitat present at site 20 19 18 17 16	16% to 30% major productive habitat, by aerial extent 15 14 13 12 11	6% to 15% major productive habitat 10 9 8 7 6	Less than 5% major productive habitat 5 4 (3) 2 1
Water Velocity <u>9</u>	Max. observed at typical transect: > 0.25 m/sec. But < 1 m/sec ≥0.33 0.31 0.29 0.27 >0.25 20 19 18 17 16	Max. observed at typical transect: >0.1 to 0.25 m/sec 0.25 0.21 0.17 0.13 >0.1 15 14 13 12 11	Max. observed at typical transect: 0.05 to 0.1 m/sec 0.1 0.09 0.07 0.06 0.05 10 (9) 8 7 6	Max. observed at typical transect: <0.05 m/sec; or spate occurring: > 1 m/sec <0.05 0.04 0.03 0.01 <0.01 5 4 3 2 1
Habitat Smothering <u>11</u> ----- Primary Score <u>33</u>	Adequate number of stable pools (1-2 per 12 times width) and <25% of habitats affected by sand, silt, or algae. 20 19 18 17 16	Adequate number of stable pools (1-2 per 12 times width) and >25% of habitats affected by sand, silt, or algae. 15 14 13 12 (11)	Does not have required number of stable pools (1-2 per 12 x width) and/or has shallow pools (<2 x prevailing depth). 10 9 8 7 6	Stable pools are absent. Most habitats affected by sand, silt, or algae accumulation. 5 4 3 2 1
Secondary Habitat Components	Expected sinuosity given the stream width. No evidence of dredging or artificial straightening. No spoil banks.	Good sinuosity within old channelized area. Evidence of dredging in the past (>25 yrs) but mostly recovered.	Straightened with trapezoidal cross section, but has a small degree of sinuosity developed within channelized area.	Straightened or engineered by dredging, has trapezoidal or box cut cross section, lacks required pools. May have spoil banks.
Artificial Channelization <u>20</u>	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Bank Stability	Bankfull > 60% of bank height. Slope of bank ≤ 60° from bankfull to top of bank. Bankfull is within or above the root zone with few raw, eroded areas.	Only meets 2 of the 3 requirements for optimal bank stability.	Only meets 1 of the 3 requirements for optimal bank stability.	Bankfull < 60% of bank height. Slope of bank > 60°. Bankfull is below the root zone with raw, eroded areas.
Right Bank <u>10</u> Left Bank <u>10</u> <u>20</u>	(10) 9	8 7 6	5 4	3 2 1
Riparian Buffer Zone Width	Width of vegetation greater than 18 m	Width of vegetation >12 to 18m	Width of vegetation 6 to 12 m. human activities close to system	Less than 6 m of buffer zone due to intensive human activities
Right Bank <u>10</u> Left Bank <u>10</u> <u>20</u>	(10) 9	8 7 6	5 4	3 2 1
Riparian Zone Vegetation Quality	Over 80% of riparian surfaces consist of normal, expected plant community for given sunlight & habitat conditions (e.g., native plants; tree, shrub, and forbs represented, if appropriate). Minimal disturbance.	>50% to 80% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Some disruption in community observed.	25% to 50% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions). Disruption obvious.	Less than 25% of riparian zone is undisturbed (normal, expected plant community for given sunlight & habitat conditions).
Right Bank <u>9</u> Left Bank <u>9</u> <u>18</u> ----- Secondary Score <u>78</u>	10 (9)	8 7 6	5 4	3 2 1

111 TOTAL SCORE

Date: <u>2/27/18</u>	Analyst: <u>Mike Linger / Mike Drennan</u>	Signature: 
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DEP Form FD 9000-4 Stream/River Habitat Assessment Sketch Sheet



Location: Cow Creek @ 75m
E of Deep Creek
Date: 2/27/18
Sampler: Mike Drinnan / Mike Linger

100 m: Latitude	28.812837
Longitude	-81.053832
0 m: Latitude	28.812608
Longitude	-81.054714
Substrates: Code key, draw proportionate habitat abundance.	
☐ S	Snags .5
☒ R	Roots/undercut banks .4
☐ L	Leaf Packs (or mats) .4
☐ A	Aquatic Macrophytes .9
☐	
☐	
☐ P	Pools total # observed = 2 # range expected = 2
Average width	5.5 m
Average depth	0.7 m
Velocity measured at	10, 40, 70 meter mark.
WQ & chemistry taken at 70 meter mark.	
Habitat Smothering: Note areas (on map) where sand or silt is smothering substrates, limiting habitability.	
Bank Stability: Note areas (on map) with unstable, eroding banks.	
Riparian Buffer Width: Note areas (on map) where natural vegetation is altered or eliminated.	

Plants observed / other notes:

- Substrate Highly organic
- medium smothering through
- Good buffer all around

BF=BH Length of grid represents 100 m of stream (not linear meters).
WLT=5m (Horizontal scale is double vertical scale, draw proportionately).

62-160.800, F.A.C

S 2.7

L 2.2

A 4.7

$$9.6 \text{ m}^2 / \text{SSD} = 12\%$$

$$Z = 0.7 \text{ m}$$

$$V = 0.09 \text{ m/s}$$

$$W = 5.5 \text{ m}$$

- Leaf packs mostly smothered, considered minor

Revision Date: March 1, 2014

DEP FORM FD 9000-25 Rapid Periphyton Survey Field Sheet

Site: <u>Low Creek</u>					County: <u>Volusia</u>		Date: <u>2/27/18</u>		Investigators: <u>Mike Linger</u>	
					STORET Station Number: <u>62CE0172</u>					

Transect (m)	Point 1=right 9=left	Algal Thickness Rank (N-6, X)	Estimated	Canopy Cover	Transect (m)	Point 1=right 9=left	Algal Thickness Rank (N-6, X)	Estimated	Canopy Cover
0	1	N			60	1	N		
	2	N	✓			2	N		
	3	N	✓			3	N	✓	
	4	N	✓			4	N	✓	
	5	N	✓	16		5	N	✓	40
	6	N	✓			6	N	✓	
	7	N	✓			7	N	✓	
	8	N				8	N	✓	
	9	N				9	N		
10	1	N			70	1	N		
	2	N				2	N		
	3	N	✓			3	N	✓	
	4	N	✓			4	N	✓	
	5	N	✓	24		5	N	✓	32
	6	N	✓			6	N	✓	
	7	N	✓			7	N	✓	
	8	N				8	N		
	9	N				9	N		
20	1	N			80	1	N		
	2	N	✓			2	N		
	3	N	✓			3	N	✓	
	4	N	✓			4	N	✓	
	5	N	✓	32		5	N	✓	28
	6	N	✓			6	N	✓	
	7	N	✓			7	N	✓	
	8	3				8	N		
	9	N				9	N		
30	1	N			90	1	N		
	2	N	✓			2	N		
	3	N	✓			3	N	✓	
	4	N	✓			4	N	✓	
	5	N	✓	36		5	N	✓	24
	6	N	✓			6	N	✓	
	7	N	✓			7	N	✓	
	8	N				8	N		
	9	N				9	N		
40	1	N			100	1	N		
	2	N	✓			2	N		
	3	N	✓			3	N	✓	
	4	N	✓			4	N	✓	
	5	N	✓	32		5	N	✓	20
	6	N	✓			6	N	✓	
	7	N	✓			7	N	✓	
	8	N				8	N		
	9	N				9	N		
50	1	N							
	2	3							
	3	N	✓						
	4	N	✓						
	5	N	✓	28					
	6	N	✓						
	7	N	✓						
	8	N	✓						
	9	N							

Secchi depth	0.3
Estimated?	

# points ranked 4-6	
total points assessed	
% points ranked 4-6	

Check accompanying data collected at same site/date.	
Algal mat sample	
Linear Veg Survey	✓
Habitat Assessment	✓
SCIBiorecon	✓
Water sample	✓
RQ-2018-02-26-68	

Algal Thickness Rank	
N	rough, no algae, slimy, algae up to 1mm
3	>1mm - 6mm
4	>6mm - 20mm
5	>20mm - 10 cm
6	>10 cm

Record "N" and check "Estimated" for points deeper than the Secchi depth; algae are presumed absent. Check "Estimated" if thickness estimated for deep points which can be seen but not reached.

Record "X" for points shallower than Secchi depth for which substrate cannot be seen or reached with the hand. No estimated rank.

Record canopy cover as the number of small densiometer quadrants (out of 96) that HAVE canopy cover. Measure facing upstream at point 4, 5, or 6.

Collect algal mat sample following DEP SOP FS 7240 if the percentage of total sampled points with a thickness rank of 4, 5, or 6 is >20%.

DEP FORM FD 9000-32: LINEAR VEGETATION SURVEY FIELD SHEET

Waterbody: Cow Creek	Date: 2/27/18	County: Volusia	Storet Number: G2CE0172
Analyst: Mike Linger, Mike Drennan	Signature: <i>Boeklin</i>		

Comments:

Instructions: Note taxa growing in the water with a checkmark if present, "D" if dominant, and "C" if codominant (dominance only if 1 m² of taxa present). Note in the boxes below if no dominant are selected, and note total macrophyte abundance rank for each section. Only the most common taxa are listed; so use blank spaces for additional taxa names.

HERBACEOUS SPECIES	Meter Mark									Specimen collected (check)	HERBACEOUS SPECIES	Meter Mark									Specimen collected (check)
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90			90-100	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	
<i>Alternanthera philoxeroides</i>		✓		✓	✓	✓	✓	✓	✓		<i>Micranthemum glomeratum</i>										
<i>Bacopa caroliniana</i>											<i>Micranthemum umbrosum</i>										
<i>Bacopa monnieri</i>											<i>Myriophyllum aquaticum</i>										
<i>Bidens mitis</i>									✓		<i>Najas guadelupensis</i>										
<i>Boehmeria cylindrica</i>											<i>Nuphar luteum</i>										
<i>Centella asiatica</i>											<i>Orontium aquaticum</i>										
<i>Ceratophyllum demersum</i>											<i>Panicum hemitomon</i>		✓	✓							
<i>Chara</i>											<i>Panicum repens</i>										
<i>Cicuta maculata</i>											<i>Panicum rigidulum</i>										
<i>Cladium jamaicense</i>											<i>Pistia stratioides</i>		✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Colocasia esculenta</i>											<i>Polygonum glabra</i>										
<i>Commelina diffusa</i>											<i>Polygonum hydropiperoides</i>										
<i>Commelina virginica</i>											<i>Polygonum punctatum</i>										
<i>Crinum americanum</i>											<i>Pontederia cordata</i>										
<i>Diodia virginiana</i>											<i>Potamogeton illinoensis</i>										
<i>Eichhornia crassipes</i>											<i>Ruellia simplex</i>										
<i>Eleocharis (wispy viviparous)</i>											<i>Sacciolepis striata</i>		✓	✓	D	✓					
<i>Hydrilla verticillata</i>											<i>Sagittaria kurziana</i>										
<i>Hydrocotyle</i>	D		✓	✓	D	D	✓		D		<i>Sagittaria lancifolia</i>										
<i>Hygrophila polysperma</i>											<i>Sagittaria latifolia</i>										
<i>Hymenocallis</i>											<i>Salvinia minima</i>		✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Lachnanthes caroliniana</i>											<i>Samolus parviflora</i>										
<i>Landoltia punctata</i>		✓	✓	✓	✓	✓	✓	✓	✓		<i>Saururus cernuus</i>										
<i>Lemna</i>		✓	✓	✓	✓	✓	✓	✓	✓		<i>Sparganium americanum</i>										
<i>Limnophila sessiflora</i>											<i>Typha</i>										
<i>Ludwigia leptocarpa</i>											<i>Vallisneria americana</i>										
<i>Ludwigia palustris</i>											<i>Zizania aquatica</i>										
<i>Ludwigia peruviana</i>																					
<i>Ludwigia repens</i>											<i>spiral Wolffia sp</i>	✓		✓	✓	✓	✓	✓	✓	✓	✓
<i>Luziola fluitans</i>											<i>Oxycaryum cubense</i>			✓							
											<i>azolla</i>			✓	✓	✓	✓	✓	✓	✓	✓
											<i>cephalanthus occidentalis</i>				✓						