



Rapid Periphyton Survey (RPS) Procedure

November 19, 2019

Aquatic Ecology and Quality Assurance

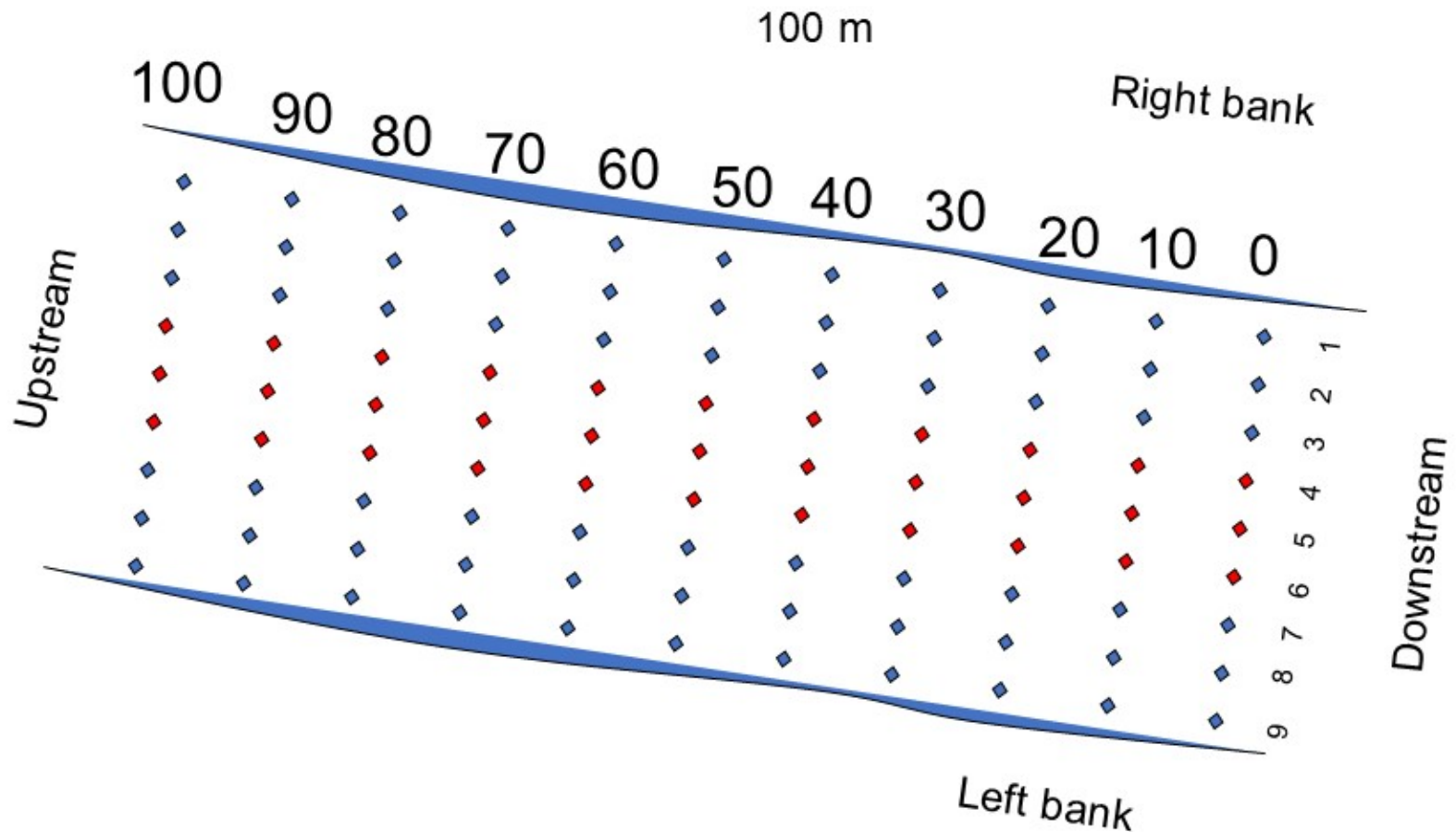


Rapid Periphyton Survey (RPS)

- The RPS quantifies the length of attached algae (periphyton) and extent (coverage) in a 100 m stream segment
- Follow DEP SOP FS 7230
- Conduct in conjunction with:
 - Habitat Assessment (SOP FT 3100)
 - Linear Vegetation Survey (LVS; SOP FS 7320), and
 - Stream Condition Index (SCI; SOP SCI 1000)



RPS Conceptual Layout





Assessing Algal Occurrence

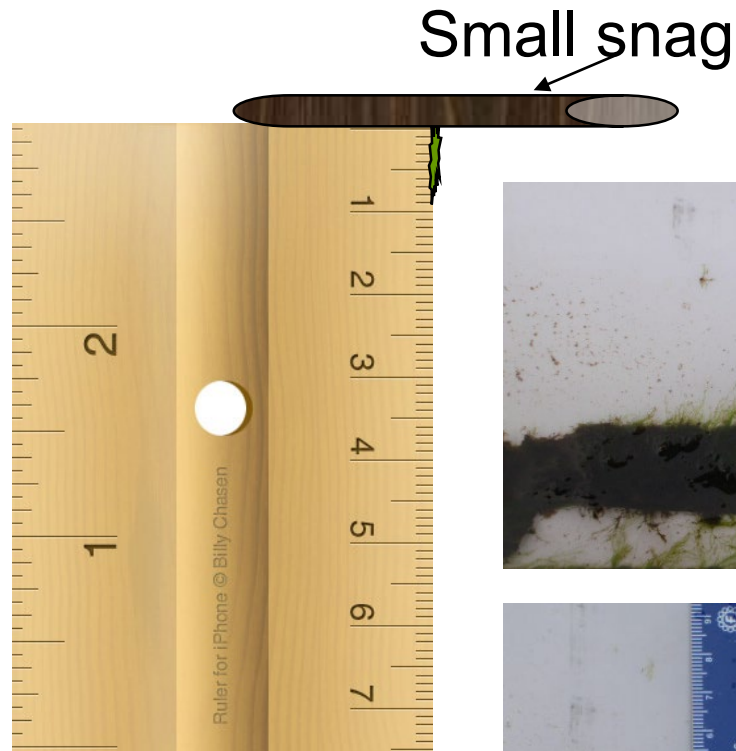
- After scanning the area for safety, choose points 1-9 haphazardly – that is, choose the actual point without looking (and potentially biasing your selection)
- Measure average algae length, perpendicular to substrate, at each point



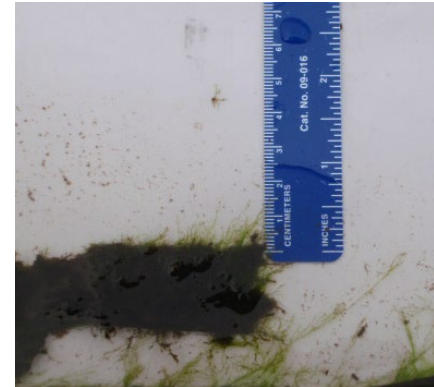


RPS Ranks

Rank	Algae Lengths
N	rough surface with no algae, slimy, or algae up to 1 mm
3	>1 mm to 6 mm
4	6 mm to 20 mm
5	20 mm to 10 cm
6	>10 cm



Average length is
>1 mm to <6 mm
= Rank 3

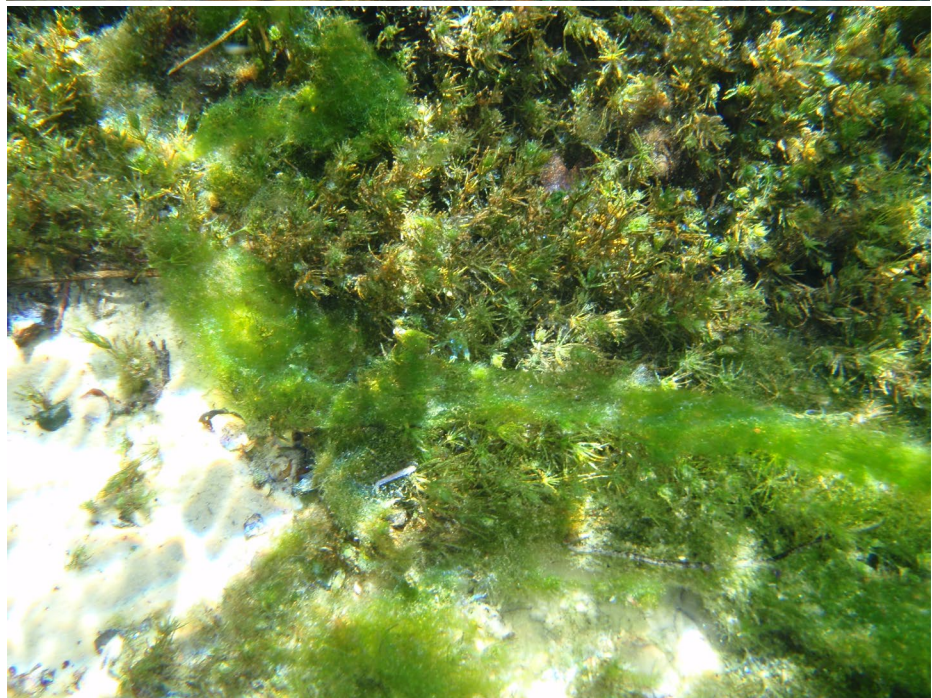




RPS Ranks 4 or 5



Length 6 mm to 10 cm





RPS Rank 6



Length greater than 10 cm





Algal Observations

DEP FORM FD 90

Site: *Wakulla River*

Transect (m)	Point 1=right 9=left	Algal Thickness Rank (N-6, X)	Estimated	Canopy Cover
0	1	6	✓	
	2	6	✓	
	3	N	✓	
	4	6	✓	
	5	3	✓	0
	6	5	✓	
	7	3	✓	
	8	3	✓	
	9	N	✓	

Left bank Right bank

9 8 7 6 5 4 3 2 1

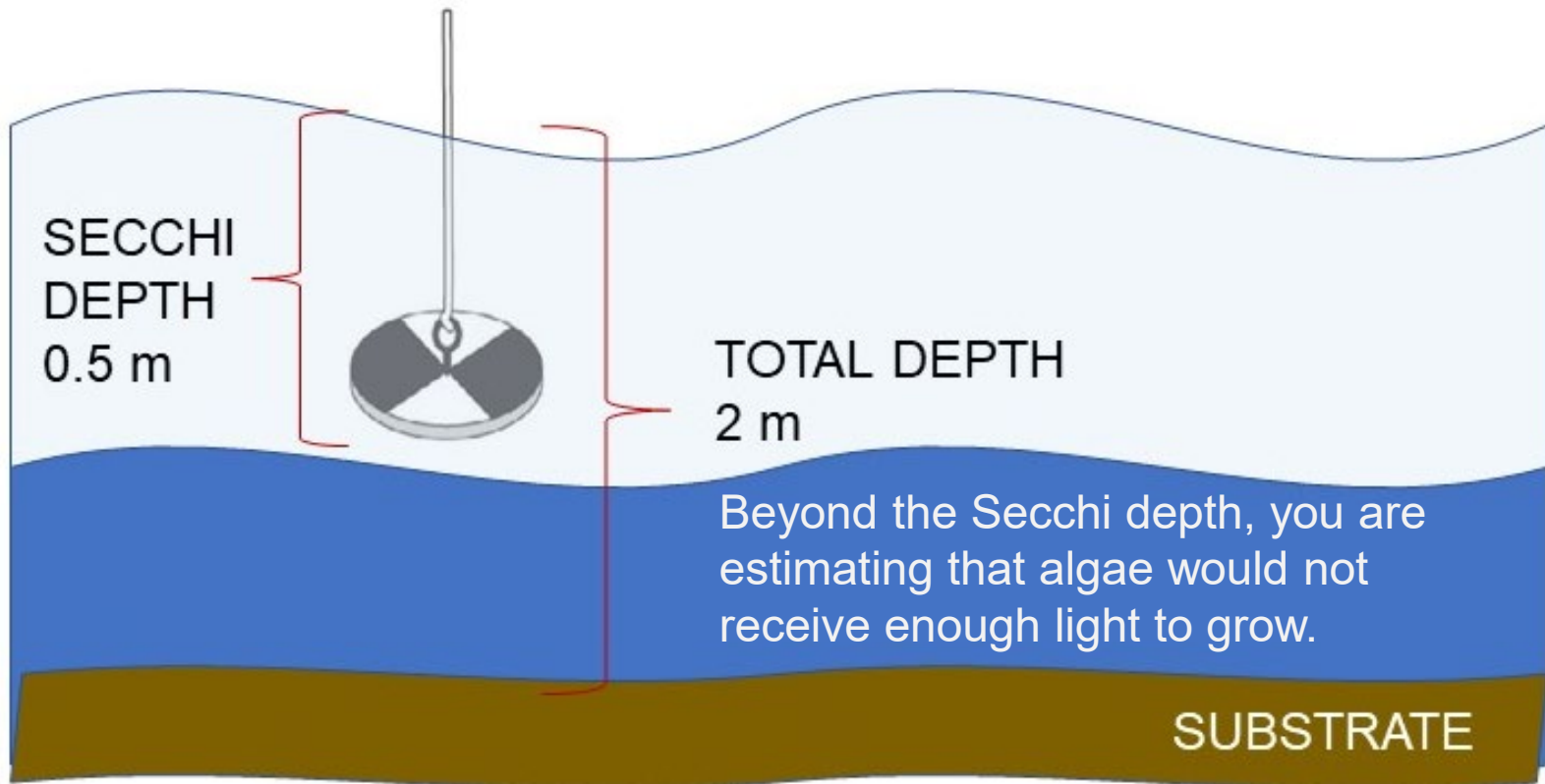


Assessing Algal Occurrence

- Record “N” when:
 - The substrate feels “rough, no algae present, slimy, or algae up to 1 mm”
 - The substrate is deeper than the Secchi depth (also check “Estimated”)
 - You cannot physically reach the substrate, but you can clearly see the substrate and no algae are present (also check “Estimated”)
- Record “Estimated” when:
 - The substrate is deeper than the Secchi depth
 - You cannot physically reach the substrate, but you can clearly see the substrate – record rank and check “Estimated”



Record “N” and check
“Estimated” for points deeper
than the Secchi depth



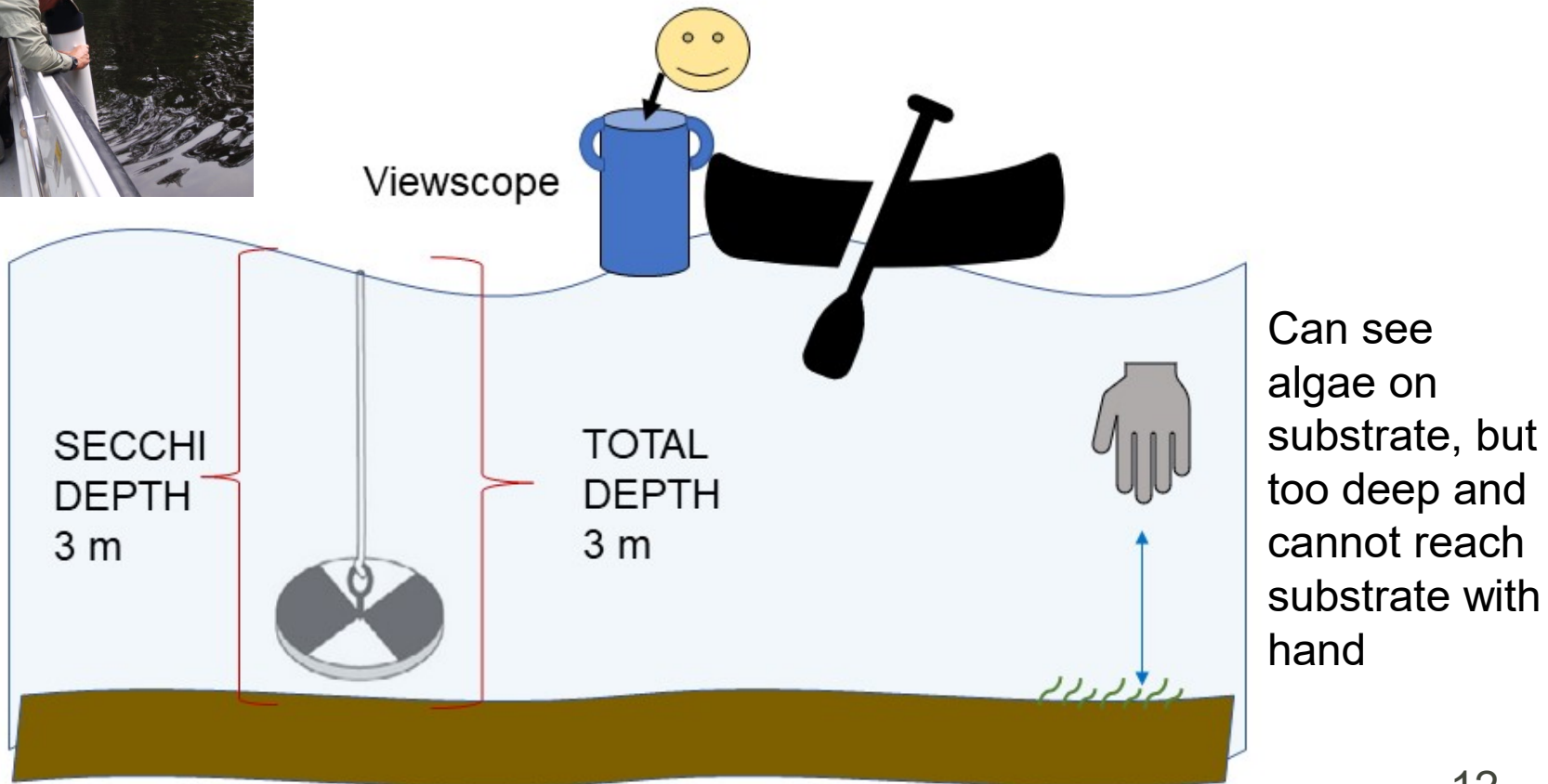
Large Rivers

- Sampled by boat
- Deep, wide, dark water system
- Secchi not VOB
- Can only reach points 1 and 9 on either bank

Record appropriate rank for points that can be reached. Record “N” and check “Estimated” for points deeper than the Secchi depth; algae are presumed absent.



Check “Estimated” thickness estimated for deep points which can be seen but not reached.



Deep, clear spring

- Sampled from boat, used Viewscope
- High velocity
- Secchi VOB
- Clear, not murky

Record appropriate rank for points. Check “Estimated” for deep points which can be seen but not reached.



Photo credit: DEP

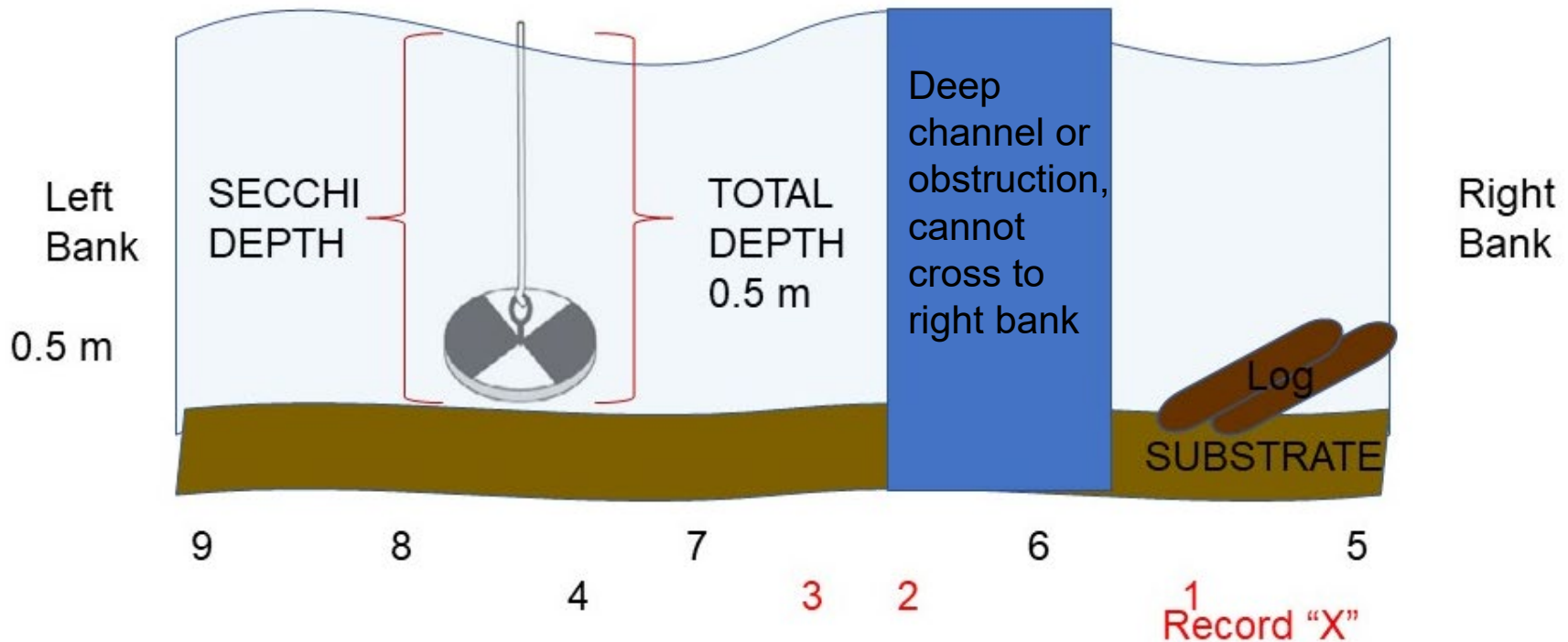


Assessing Algal Occurrence

- Record “X” when:
 - The substrate is shallower than the Secchi, but you cannot clearly see the substrate nor reach with your hand.

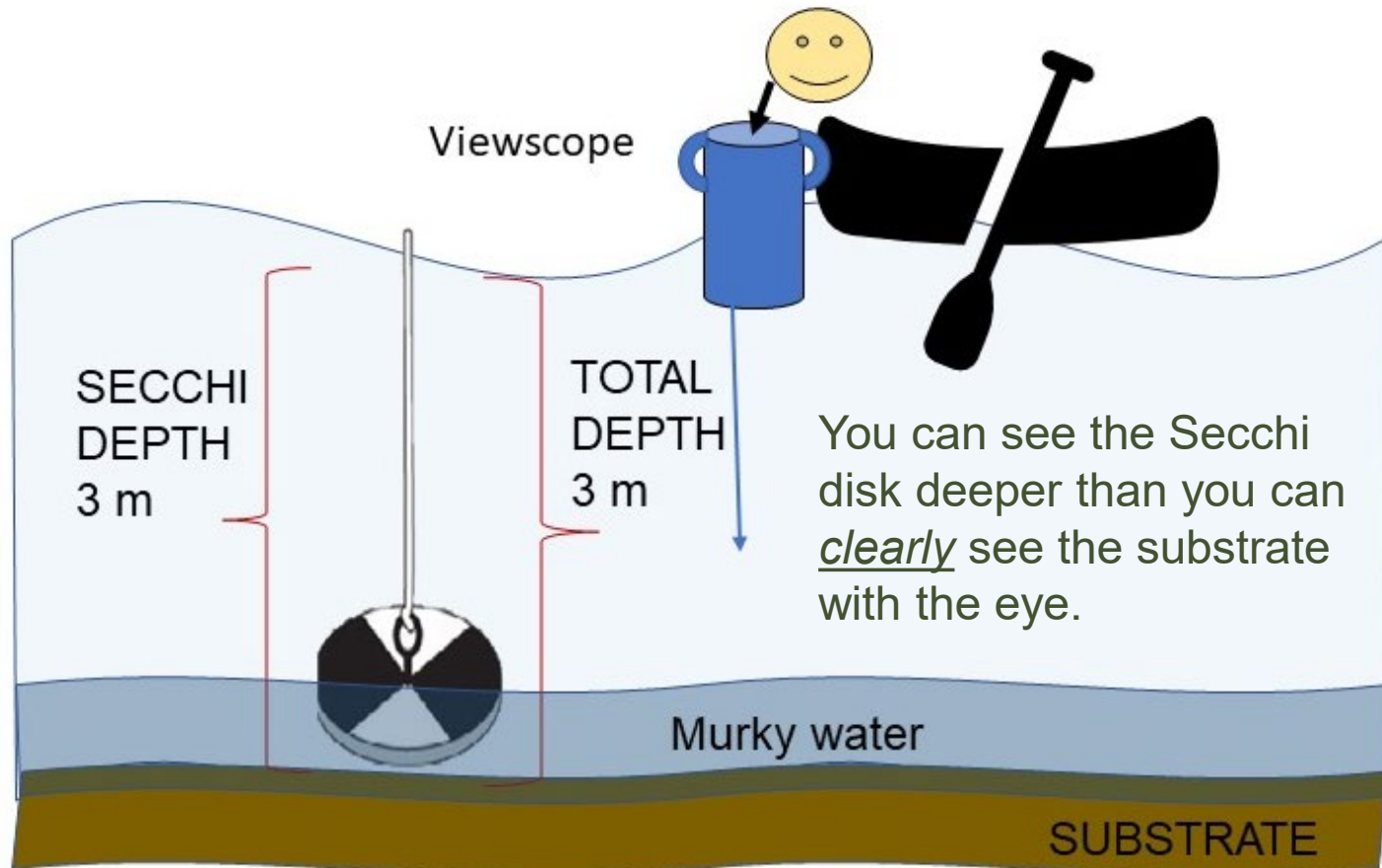


Record “X” for points shallower than or equal to Secchi depth for which substrate cannot be seen or reached with the hand. No estimated rank





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





- Record “X” for points shallower than or equal to Secchi depth for which substrate cannot be CLEARLY seen or reached with the hand. No estimated rank.
- Record appropriate rank for points shallower than or equal to Secchi depth for which substrate can be clearly seen or reached with the hand.
- Check “Estimated” if thickness estimated for deep points which can be seen but not reached.

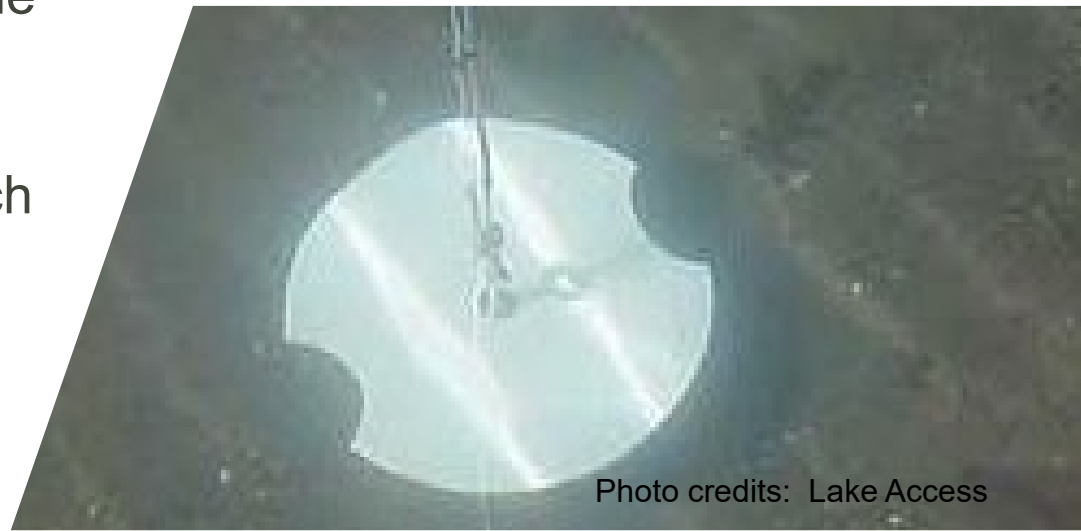
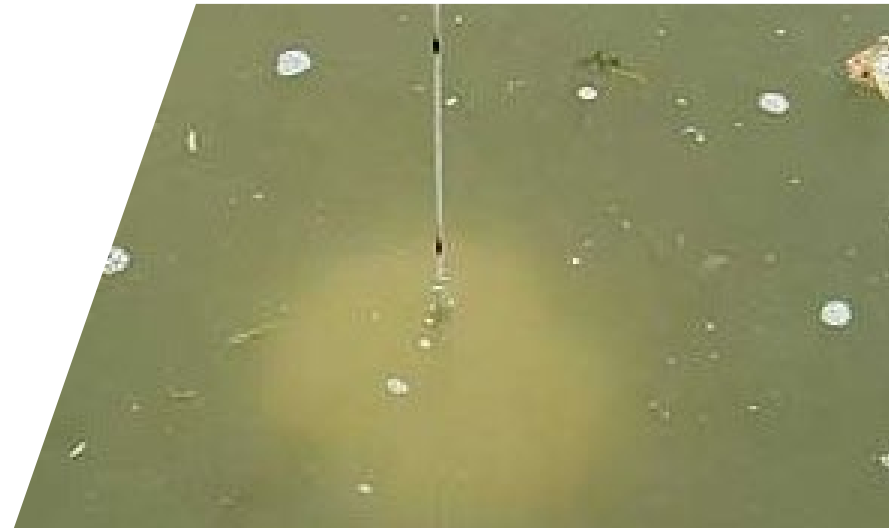


Photo credits: Lake Access

Deep, tannic canal

- Sampled from boat
- Secchi VOB
- Tannic, could not clearly see substrate
- Could not reach points 3-7

Record appropriate rank for points that can be reached. Record “X” for points shallower than Secchi depth for which substrate cannot be seen or reached with the hand. No estimated rank.

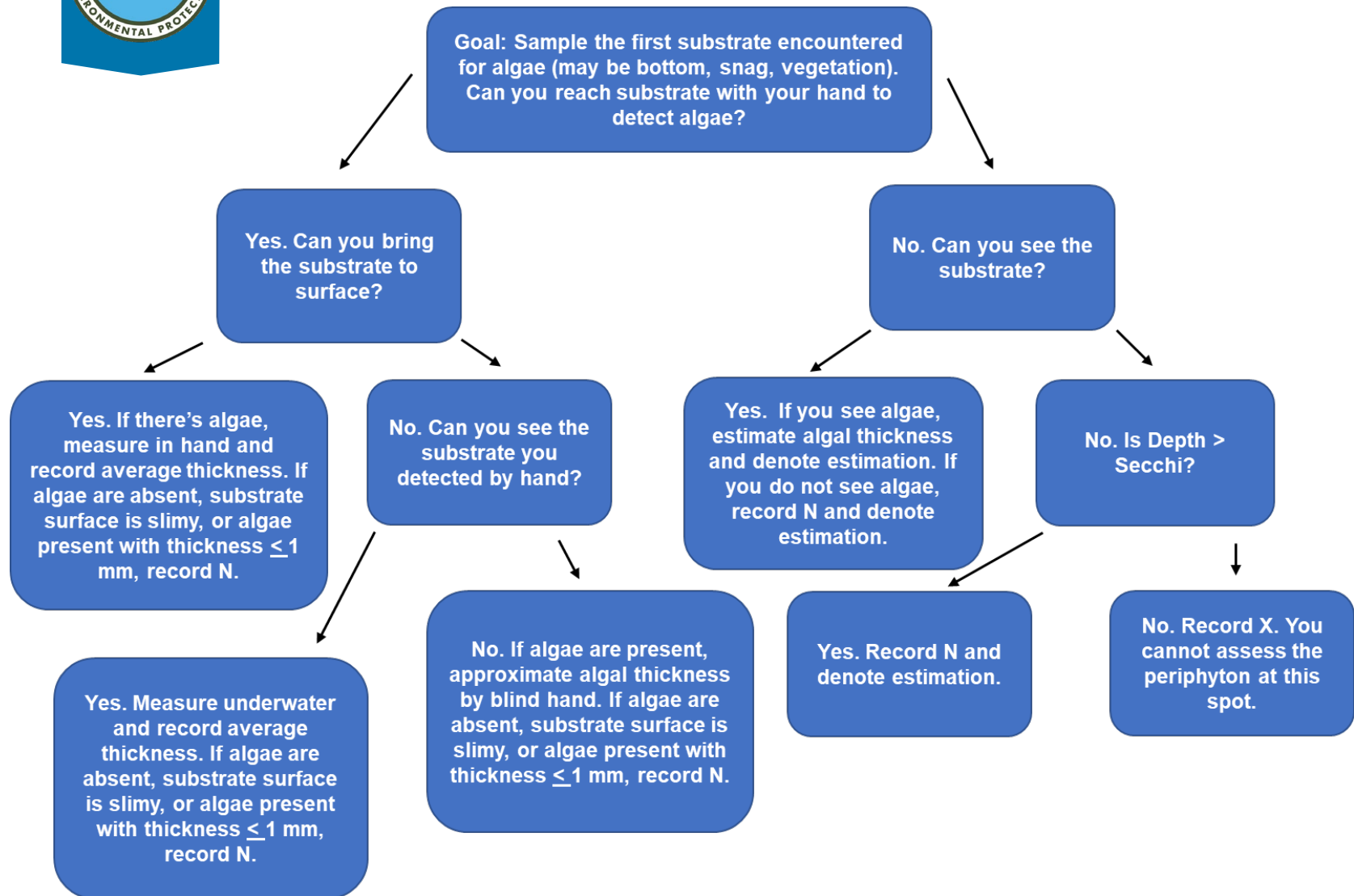


Assessing Algal Occurrence

- Record “N” when:
 - The substrate feels “rough, no algae present, slimy, or algae up to 1 mm”
 - The substrate is deeper than the Secchi depth (also check “Estimated”)
 - You cannot physically reach the substrate, but you can clearly see the substrate and no algae are present (also check “Estimated”)
- Record “X” when:
 - The substrate is shallower than the Secchi, but you cannot clearly see the substrate nor reach with your hand.
- Record “Estimated” when:
 - The substrate is deeper than the Secchi depth
 - You cannot physically reach the substrate, but you can clearly see the substrate – record rank and check “Estimated”
- **Do NOT leave any box blank**



FS 7230 RPS Flowchart





Assessing Algal Occurrence

- After completing the survey, count the points with ranks 4, 5, or 6. If $>20\%$ of the total points evaluated (include "N" points but not "X"), collect a sample of the dominant type of algae for taxonomic identification
- Follow SOP FS 7240 for algal mat collection
- Keep sample on ice until it is delivered to the lab (no chemical preservation)



RPS Datasheet

FD 9000-25

DEP FORM FD 9000-25 Rapid Periphyton Survey Field Sheet

Site: Chipoka R County: Calhoun Date: 11/2/2017 Investigators: S. Panek, J. Jackson, A.O'Neil

STORET Station Number: 31020012

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				5	N		
	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				5	N		
	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				5	N		
	6	N				6	N		
	7	N				7	N		
	8	N				8	N		
	9	N				9	N		

Secchi depth: YOB
Estimated: YOB

points ranked 4-6: 19
total points assessed: 30
% points ranked 4-6: 21

Check accompanying data collected at same site/date:
Algal mat sample: /
Linear Veg Survey: /
Habitat Assessment: /
SC/Biorecon: /
Water sample: /
RQ: 2017-10-30-59

Algal Thickness Rank

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

Rank	Algae Lengths
N	rough surface with no algae, slimy, or algae up to 1 mm
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4	6 mm to 20 mm
5	20 mm to 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.

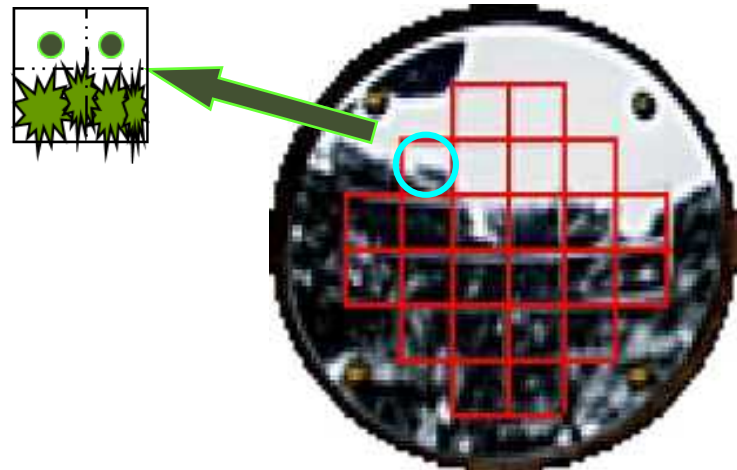


Estimating Canopy Cover

- Use a spherical densiometer
- Hold instrument level and away from body so that observer's head is just outside the grid
- Divide each of the 24 etched boxes into 4 imaginary boxes. Imagine a "point" in the center of each of the 96 smaller boxes
- Count the small squares or points that ARE COVERED with vegetation. Record this number on the datasheet
- Measure canopy cover between RPS points 4 and 6, ideally at point 5, on each transect. Do not take a canopy cover measurement if this section of the transect is unreachable. Indicate unreachable points with an "X" or appropriate comment.



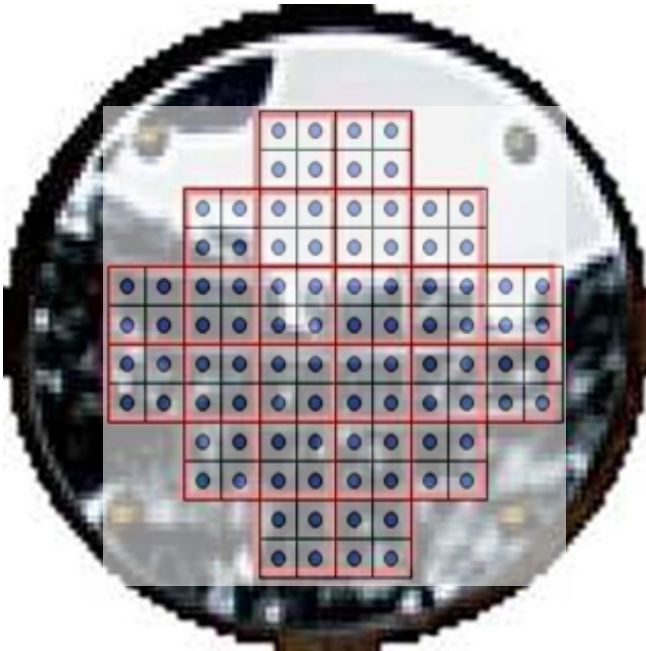
level





Estimating Canopy Cover

71 squares with canopy cover



DEP FORM FD 9000-25 Rapid Periphyton Survey Field Sheet									
Site: <i>Chipoka R</i>					County: <i>Calhoun</i>	Date: <i>11/2/2017</i>	Investigators: <i>S. Panek, J. Jackson, A.O'Neil</i>		
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	60	1	N		0
	2	N				2	N		
	3	N				3	N		
	4	N				4	N		
	5	N				5	N		
	6	N				6	N		
	7	N				7	N		
	8	N				8	N		
	9	X				9	N		
10	1	N		70	70	1	N		0
	2	N				2	N		
	3	N				3	N		
	4	N				4	N		
	5	N				5	N		
	6	N				6	N		
	7	N				7	N		
	8	N				8	N		
	9	N				9	N		
20	1	N		80	80	1	N		0
	2	N				2	N		
	3	N				3	N		
	4	N				4	N		
	5	N				5	N		
	6	N				6	N		
	7	N				7	N		
	8	N				8	N		
	9	X				9	N		
1	N		1	N					

Secchi depth *108*
 Estimated? ☐

points ranked 4-6 *19*
 total points assessed *30*
 % points ranked 4-6 *21*

Check accompanying data collected at same site/date.
 Algal mat sample ☒
 Linear Veg Survey ☒
 Habitat Assessment ☒
 SC/Biorecon ☒
 Water sample ☒
 RQ-2017-10-30-59

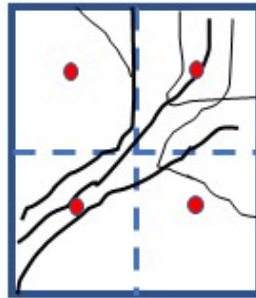
Algal Thickness Rank	
N	rough, no algae, slimy, algae up to 1mm
3	>1mm - 6mm
4	>6mm - 20mm
5	>20mm - 10 cm
6	>10 cm

Record "71" for canopy cover on RPS field sheet



Estimating Canopy Cover

- Densiometer measurement should indicate available light on the sampling date



Winter



Summer

- Hypothetical view of one (of 24) box of the densiometer when branches are bare (winter) and full of leaves (summer)
- Although there is something in each box in both cases, the “point” is covered for 2 in winter and 4 in summer.



Things you might confuse with periphyton – DO NOT include in RPS

Macroalgae:



Nitella



Chara

Bryophytes: mosses and liverworts:



Liverworts



Sphagnum



Fontinalis



Resources

- SOP FS 7230 - Posted here:
<https://floridadep.gov/dear/quality-assurance/content/dep-sops>
- Use in support of numeric nutrient criteria implementation described in “Implementation of Florida’s Numeric Nutrient Standard.” <https://floridadep.gov/dear/water-quality-standards/documents/nnc-implementation>
- Field form (**FD 9000-25**) available on DEP website here:
<https://floridadep.gov/dear/quality-assurance/content/sop-forms>



Just Some Humor

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search ID: rman145

"FRANKLY, YOUR GENE POOL NEEDS TO
HAVE THE ALGAE SKIMMED OFF."

