



*Florida Department of
Environmental Protection*

Proposed Changes to DEP Bioassessment SOPs

Standards and Assessment Section

November 2011



Outline

- General Sampling
- Water Sampling
- Biological Assessment
 - Macroinvertebrates
 - Plants
 - Algae
 - Habitat Assessment





Water Sampling Edits

- FC 1002 Analyte-Free Water Storage
 - Removes specific three day limitation on storage of analyte-free water for field blanks. Recommends that analyte-free water be stored for minimal amount of time. Demonstrate effectiveness with clean blanks.



Water Sampling Edits, cont'd

- FS 1002 Sampling Order
 - Removed recommended order of analytes for sampling



Water Sampling Edits, cont'd

- FS 2000 Section 1.5.4
 - Filtration must be completed (rather than begin) within 15 minutes of sample collection.



Water Sampling Edits, cont'd

- FS 2100 Shallow Water Sampling
 - New subsection describes limitations and cautions for sampling in very shallow water.
 - Do not sample water < 10 cm deep
 - Be extremely cautious in still waters (e.g., wetlands)
 - Use of dipper may be helpful in still waters



Biological Sampling - Macroinvertebrates

- Stream Condition Index (SCI)
- Biological Reconnaissance (Biorecon)
- Lake Condition Index (LCI)
- Dredge and core sampling
- Hester-Dendy sampling
- Wetland Condition Index (WCI)
- Macroinvertebrate ID QC





SOP Structure – New SOPs

- Combined field method, lab method, quality assurance, and documentation requirements into single SOPs for:
 - Stream Condition Index (SCI),
 - Biological Reconnaissance (Biorecon), and
 - Lake Vegetation Index (LVI)

SCI 1000 Structure

- SCI 1000 - Field
 - SCI 1100 – Sampling method (FS 7420)
 - SCI 1110 – field documentation (FD 5326)
 - SCI 1200 – Training requirements (FA 5710)
 - SCI 1300 – Field proficiency criteria (FA 4310)
- SCI 2000 – Lab
 - SCI 2100 – Index calculation (LT 7200)
 - SCI 2110 – References
 - SCI 2120 – Calculation documentation (LD 7120)
 - SCI 2200 – Lab quality control (QC) (LQ 7400)
 - SCI 2210 - Sorting QC (LQ 7410)
 - SCI 2211 – Sorting documentation (LD 7231)
 - SCI 2220 – Taxonomic ID QC (LQ 7420)
 - SCI 2221 - Taxonomic ID documentation (LD 7232)
 - SCI 2230 – Taxonomic effort (Table LT 7900-1)
- Appendix – Training checklist



BRN 1000 Structure

- **BRN 1000 - Field**
 - BRN 1100 – Sampling method (FS 7410)
 - BRN 1110 – field documentation (FD 5325)
 - BRN 1200 – Training requirements (FA 5710)
 - BRN 1300 – Field proficiency criteria (FA 4310)
- **BRN 2000 – Lab**
 - BRN 2100 – Index calculation (LT 7100)
 - BRN 2110 – References
 - BRN 2120 – Calculation documentation (LD 7110)
- Refers to pertinent sections of SCI 1000 for taxonomic identification quality control requirements and field training checklist





Protocol Changes – SCI 1100, BRN 1100

- Sampling must follow SCI Primer (updated)
- Do not sample if velocity < 0.05 m/s
- Allow 6 months (formerly 3) of wetted conditions before sampling after a stream was dry (with no refugia for organisms)
 - SCI Primer allows for sampling after 3-4 months if clear evidence that community has recovered
- Allow 1 month flowing (≥ 0.05 m/s) conditions before sampling after a stream was stagnant





Protocol Change - QA (SCI 1300, BRN 1300)

- Training and testing now required to submit SCI or Biorecon data to DEP
 - Take DEP training
 - Train at 12 sites
 - Pass **online test** and field audit for initial proficiency
 - Pass online test and field demonstration **every 5 years** (new refresher audit)





Structural Change – SCI 2100

- Information included in SCI 2100 rather than just in Biorecon calculation SOP
 - Taxon collapsing protocol
 - Sensitive taxa list
 - Long-lived taxa list



Clarification – BRN 1100

- Do not use lab-picking method unless necessary for safety



Lake Condition Index (LCI)

- Structural changes
 - Calculation SOP LT 7300 now includes lab analysis and data reduction protocols formerly referenced from SCI and Biorecon SOPs
- Clarification
 - Specifically refers to Table LT 7900-1 for lowest practical taxonomic levels for ID. (Common lake taxa added to table.)





Hester-Dendy Sampling and Processing (macroinvertebrates)

- FS 7430 Sampling SOP
 - Now indicates that collections may be used for Shannon-Weaver Diversity Index
- LT 7710 - New SOP for lab processing of Hester-Dendy samples for the purpose of Shannon-Weaver Diversity Index calculation
 - Requires adherence to LQ 7400 for QA
 - Not yet posted





Dredge and Core Sampling (macroinvertebrates)

- FS 7440 and FS 7450 Sampling SOPs
 - Now indicates that collections may be used for Shannon-Weaver Diversity Index
- LT 7720 - New SOP for lab processing of dredge or core samples for the purpose of Shannon-Weaver Diversity Index calculation
 - Requires adherence to LQ 7400 for QA
 - Not yet posted





New Macroinvertebrate Wetland Condition Index (WCI)

- FS 7470 – Field collection of macroinvertebrate samples from isolated herbaceous and isolated forested wetlands
- Macroinvertebrate WCI lab methods and calculations
 - LT 7613 - isolated herbaceous wetlands
 - LT 7623 – isolated forested wetlands
- Documentation requirements in FD, LD





QC for Macroinvertebrate Lab IDs

- LQ 7400, SCI 2220
 - Requires macroinvertebrate taxonomists to analyze at least one QC sample per year
- Table LT 7900-1, SCI 2230
 - Edits to table of lowest practical taxonomic levels reflect changes in taxonomy and addition of lentic organisms
 - To be used for all freshwater index determinations (including Shannon-Weaver)





Biological Sampling - Plants

- Lake Vegetation Index (LVI)
- Linear Vegetation Survey (LVS)
- Wetland Condition Index (WCI)



LVI 1000 Structure

- LVI 1000 - Field
 - LVI 1100 – Sampling method (FS 7310)
 - LVI 1110 – field documentation (FD 5324)
 - LVI 1200 – Proficiency criteria (FA 4330)
- LVI 2000 – Lab
 - LVI 2100 – Lab QC (LQ 7300)
 - LVI 2200 - Index calculation (LT 7500)
 - LVI 2210 – Calculation documentation (LD 7140)
- Appendix (Table FT 7500-1)





Protocol Changes - LVI

- Sampling periods adjusted for regions
 - April – November in South
 - May- October in North
- Sampling must follow LVI Primer (new requirement)
- Include only taxa that are aquatic or have Florida wetland status of OBL, FAC, FACW (except for *Pinus elliotii* and vines)



Protocol Changes - LVI

- Modification in dominance assignment protocol
 - Assign one dominant if 1 taxon clearly overwhelmingly dominant
 - Otherwise assign two dominants
- Collect dominant taxa if from “tricky” group (grasses, sedges, submersed)
 - If common taxa, take photographs of dominant and codominant taxa



Protocol Changes – LVI QA (LVI 1200)

- Training and testing now required to submit LVI data to DEP
 - Train with DEP
 - Pass **new online plant ID test** annually
 - Pass team proficiency demonstration **every 2 years**
 - Each team must have at least one member who has passed the online plant ID test





Protocol Changes – LVI Calculations (LVI 2200)

- Documented in “threshold document”
 - <http://www.dep.state.fl.us/water/bioassess/pubs.htm>
- Many new or modified C of C scores based on February 2011 workshop
 - 134 changes, 107 of these went down
- %FLEPPC metric too redundant with %Native
 - Include only FLEPPC Category 1 taxa in % FLEPPC metric





Protocol Changes – LVI Calculations (LVI 2200)

- New metric scoring for all metrics, adjusted with more recent data and modified C of C scores
 - Regional scoring of % Native Metric
- New LVI Impairment Threshold
 - 43 passes, 42 fails (IWR and SSAC proposals)





New Linear Vegetation Survey (LVS)

- FS 7320 – new sampling SOP for LVS, to be used in streams and rivers
- Observe and record plant species growing in the water in 10 m stream segments included in habitat assessment
- Estimate total % cover vegetation in each segment
- Documentation requirements in FD





New Vegetation Wetland Condition Index

- FS 7330 – Field collection of plant samples from isolated herbaceous, isolated forested, or forested strand and floodplain wetlands
- Vegetation WCI calculations
 - LT 7612 - isolated herbaceous wetlands
 - LT 7622 – isolated forested wetlands
 - LT 7630 – forested strand and floodplain wetlands
- Documentation requirements in FD, LD





Biological Sampling - Algae

- Algal Blooms
- Algal Mats
- Rapid Periphyton Survey (RPS)
- Wetland Condition Index (WCI)



New Algal Bloom and Algal Mat SOPs

- FS 7110 - Algal Bloom sampling
- FS 7240 - Algal Mat sampling
 - *for collection for ID if RPS ranks 4-6 comprise >20%
- Standardized collection methods
- Sample collection for taxa identification or cyanotoxin analysis
- Scum sampling, scum core, mat core, typical grab sample
- Documentation requirements in FD





Protocol Change – Rapid Periphyton Survey (RPS, FS 7230)

- Removed assignment of algal type
- New thickness category 6 (>10 cm)
- Must collect algal mat specimen for taxonomic ID if > 20 % sampled points are thickness 4-6



New Diatom Wetland Condition Index

- FS 7250 – Field collection of diatom samples from isolated herbaceous and isolated forested wetlands
- Diatom WCI lab methods and calculations
 - LT 7611 - isolated herbaceous wetlands
 - LT 7621 – isolated forested wetlands

Note: Drafts for lab methods and calculation SOPs not yet available

- Documentation requirements in FD, LD





Stream Habitat Assessment Method

- FT 3100 Clarifications
 - Buffer zone width – mowed grass is poor
 - Velocity Scoring more clearly defined
 - $0.5 - 0.9 \text{ m/s} = 20 \text{ points}$
 - Pools must be stable for consideration in habitat smothering scoring
 - Algae added as one form of habitat smothering



Stream Habitat Assessment Method , cont'd

- FT 3100 Clarifications

- Bankfull more clearly defined:

For stream sites with a wetland floodplain, bankfull is usually the elevation of the flat floodplain.

For stream sites with an upland floodplain, bankfull is usually the inflection point on the bank.





Stream Habitat Assessment (HA) QA

- FA 5720 (Stream habitat assessment testing) – revised to require testing every 2 years at 5 sites. Successful testing is required for data submittal to DEP.
- FA 1000 Stream HA training checklist – revisions in checklist to reflect minor clarifications in HA method (FT 3100)



SHARE YOUR COMMENTS!

- Comment period closed for SCI, BioRecon, LVI
- Comments still welcome on all other changes
- Submissions via website preferred

<http://www.dep.state.fl.us/water/sas/qa/revise-62-160.htm>





*Florida Department of
Environmental Protection*

Updated Forms

Site:				County:				Date:				Investigators:			
Transect (m)	Point	Algal Thickness Rank (0 - 6)	Canopy Cover (# shaded)	Transect (m)	Point	Algal Thickness Rank (0-6)	Canopy Cover (# shaded)	Transect (m)	Point	Algal Thickness Rank (0-6)	Canopy Cover (# shaded)		Check accompanying data collected at same site/date.		
	1=right 9=left				1=right 9=left				1=right 9=left					1=right 9=left	
0	1			40	1			80	1				Water sample		
	2				2					Algal mat sample					
	3				3					SCI/Biorecon (circle 1)					
	4				4					Habitat Assessment					
	5				5					RQ:					
	6				6										
	7				7										
	8				8										
	9				9										
10	1			50	1			90	1				Algal Thickness Rank 0 rough, no algae 1 < or =0.5 mm or slimy 2 >0.5 - 1 mm 3 >1mm - 6 mm 4 >6 - 20 mm 5 >20 mm - 10 cm 6 >10 cm		
	2				2										
	3				3										
	4				4										
	5				5										
	6				6										
	7				7										
	8				8										
	9				9										
20	1			60	1			100	1						
	2				2										
	3				3										
	4				4										
	5				5										
	6				6										
	7				7										
	8				8										
	9				9										
30	1			70	1			Record an "X" for points where algae is not sampled because the substrate cannot be seen or reached with the hand. If the cell is left blank, data managers will assume point was not evaluated.							
	2				2										
	3				3										
	4				4			Record canopy cover as the NUMBER OF SMALL DENSIOMETER SQUARES (OUT OF 96) THAT HAVE CANOPY COVER. Measure while facing upstream.							
	5				5										
	6				6										
	7				7			Collect an 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%							
	8				8										
	9				9										

Metadata**No algal type
indicated****Thickness
Rank 6****Clarification
& Reminders****Collect if
>20% of 4-6**

Waterbody:	Date:	County:	Storet Number:
Analyst:		Signature:	
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.

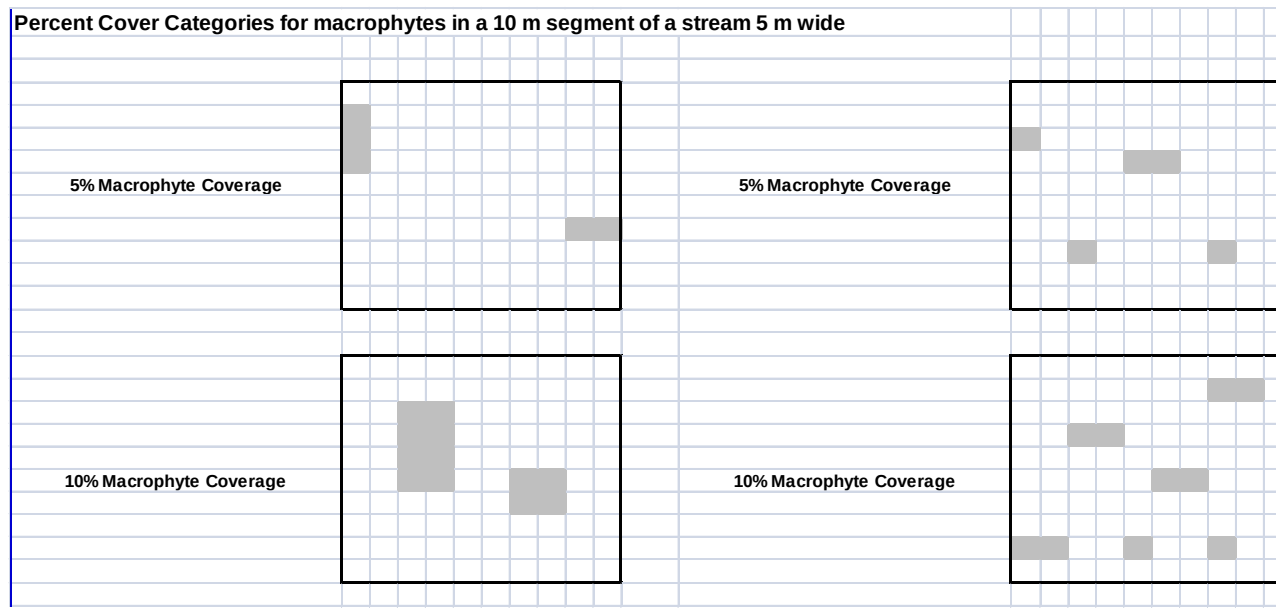
HERBACEOUS SPECIES	Meter Mark										Specimen collected (check)	HERBACEOUS SPECIES	Meter Mark										Specimen collected (check)
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100			0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	
Alternanthera philoxeroides												Micranthemum glomeratum											
Bacopa caroliniana												Micranthemum umbrosum											
Bacopa monneri												Myriophyllum aquaticum											
Bidens mitis												Najas guadelupensis											
Boehmeria cylindrica												Nuphar luteum											
Centella asiatica												Orontium aquaticum											
Cephalanthus occidentalis												Panicum hemitomon											
Ceratophyllum demersum												Panicum repens											
Chara												Panicum rigidulum											
Cicuta maculata												Pistia stratioides											
Cladium jamaicense												Polygonum glabra											
Colocasia esculenta												Polygonum hydropiperoides											
Crinum americanum												Polygonum punctatum											
Diodia virginiana												Pontedaria cordata											
Eichhornia crassipes												Potamogeton illinoensis											
Eleocharis (wispy viviparous)												Sacciolepis striata											
Fontinalis												Sagittaria kurziana											
Hydrilla verticillata												Sagittaria lancifolia											
Hydrocotyle												Sagittaria latifolia											
Hygrophila polysperma												Salix caroliniana											
Hymenocallis												Salvinia minima											
Itea virginica												Samolus parviflora											
Lachnanthes caroliniana												Saururus cernuus											

Metadata

Dom or Codom only if $\geq 1 \text{ m}^2$ present

New taxa list of most common stream taxa

Ludwigia palustris																
Ludwigia peruviana																
Ludwigia repens																
Luziola fluitans																
If no Dominant or Co-Dominant were selected, indicate with an "X"																
Indicate % cover macrophytes per section																
0-5% Macrophyte Coverage																
>5 and ≤10% Macrophyte Coverage																
>10 and ≤25% Macrophyte Coverage																
>25 and ≤50% Macrophyte Coverage																
> 50% Macrophyte Coverage																





Habitat Assessment Forms

- Sketch map – Added several items
 - Sampling event information
 - Lat/longs
 - % for each habitat
 - Places to note details about sampling locations
- Scoring form
 - In Habitat Smothering component, notes that pools must be stable to be counted

