



Linear Vegetation Survey (LVS) Procedure

November 19, 2019

Aquatic Ecology and Quality Assurance



Linear Vegetation Survey (LVS)

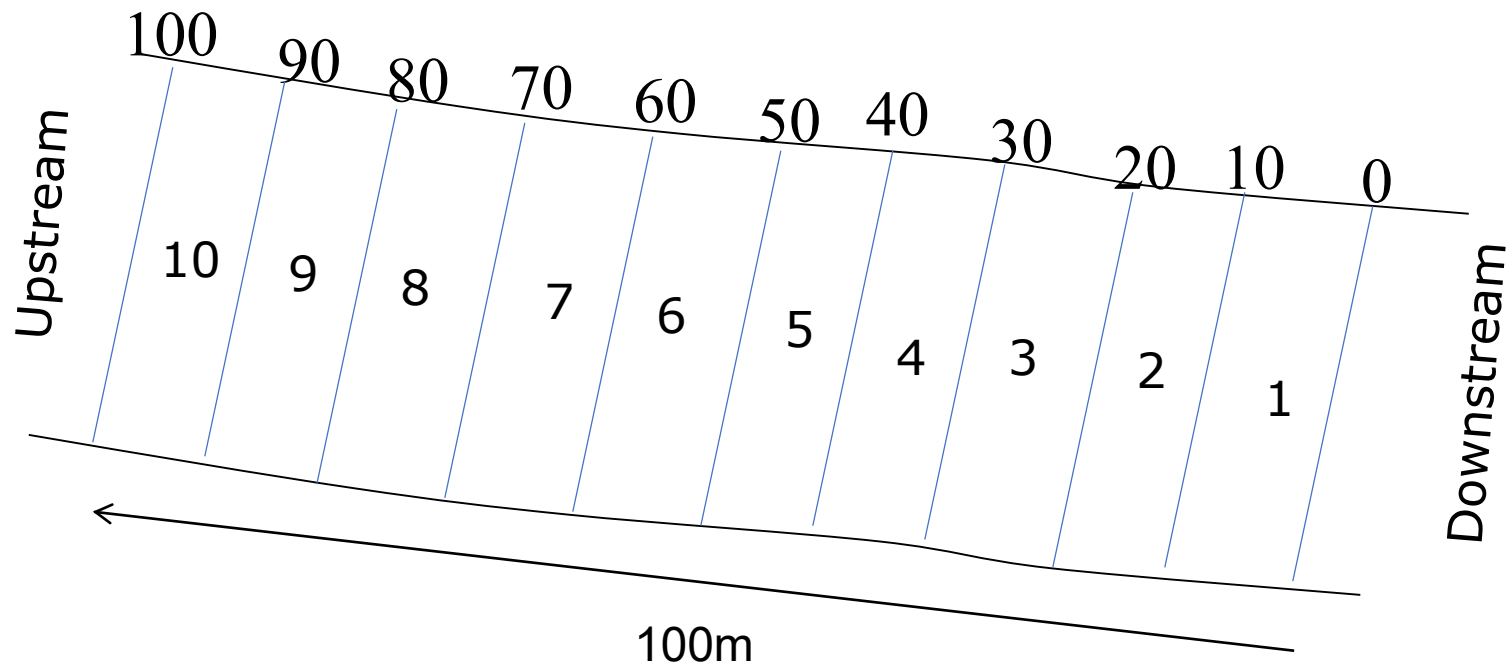
FDEP SOP FS 7320

- The Stream and River Linear Vegetation Survey (LVS) is a rapid tool to document the plant community in a 100m stream reach
- Conduct LVS in conjunction with other biological assessment methods (SCI, HA, RPS)



LVS Method Overview

- Perform in the 100m reach of stream as other methods
- Place flags every 10 m to create 10 sections
- If $>2\text{m}^2$ aquatic vegetation within wetted width of 100m stretch, perform method; otherwise, note $<2\text{m}^2$ on data sheet





LVS Method Overview

- For each section, record:
 - Plant taxa presence. Include submersed, floating, emergent plants within the **wetted** area of stream.
 - Note dominant or co-dominant taxa if any single taxon is present with $\geq 1 \text{ m}^2$ coverage (can be in patches).
 - Estimate total area of plant coverage (see back of field sheet).
 - Collect unknown taxa for ID in lab or by expert.



LVS Datasheet – FD 9000-32

Form FD 9000-32

FDEP Linear Stream Vegetation Survey (DEP SOP FS 7320)

Revised 6/12/12

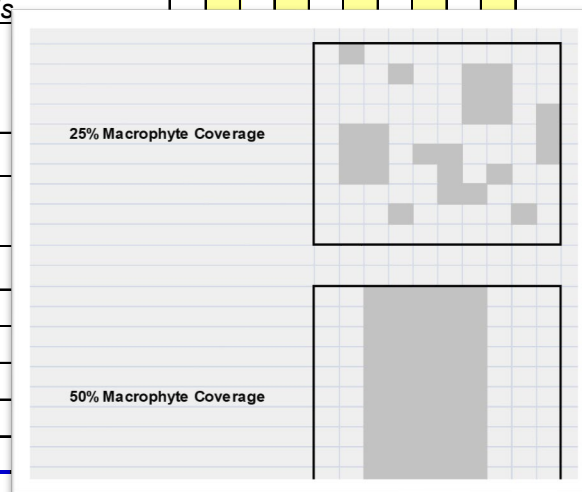
Waterbody:	Date:	County:	Storet Number:
Analyst:		Signature:	

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	
<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>Rorhmeria cylindrica</i>												<i>Najas luteum</i>											

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									



Small spring run



Include all submersed and emergent aquatic plants in the wetted area of the stream





Large river with considerable spring input



Chipola River

All of the *Vallisneria* (eelgrass) would be included in the LVS ₇



Small dark water stream



Include the floating *Nuphar* pictured



Ditch (receives wastewater discharge)



All aquatic macrophytes included in LVS ₉



Include Macroalgae in LVS

Macroalgae:



Nitella



Chara

Include mosses *if* they are structurally similar to macrophytes (2017 SOP change). Note mosses and liverworts.



Liverworts



Sphagnum moss



Fontinalis



Use of LVS for Numeric Nutrient Criteria

- When used to determine floral health associated with Ch. 62-302.531, F.A.C.:
 - Perform the method only when the total area of macrophytes $\geq 2\text{m}^2$ within the wetted area of the 100 m sampling reach.
 - **Do not include trees or shrubs**
 - Calculate the mean Coefficient of Conservatism (C of C) and % FLEPPC taxa occurrences



Coefficient of Conservatism (C of C)

- Score of 0-10 assigned to a plant species based on its ecological tolerances/fidelity to pre-settlement condition
- Subjective assignment of scores by regional botanists with many years of experience with plants in their habitats
- Establishment of scores creates an objective, repeatable tool to assess the floristic condition; works to compare sites or monitor over time



Use for Numeric Nutrient Criteria

Mean Coefficient of Conservatism (C of C)

- Mean C of C for LVS is weighted by taxon occurrence
- Presence of a taxon in a 10 m segment is one occurrence; max. # of occurrences for a taxon within the 100 m reach is ten
- For each taxon, multiply the C of C score by the number of occurrences
- Calculate the Mean C of C as the sum of these products divided by the total number of taxa occurrences in the 100 m reach.
- C of C scores found in **Table LT 7600**



Use for Numeric Nutrient Criteria

FLEPPC Exotics

- FLEPPC is the Florida Exotic Pest Plant Council
- Track and manage invasive exotic plants
- Keep lists of invasives that are displacing native species, and changing community structure and ecological function
- Categories 1 and 2 reflect the extent of the ecological damage caused



Use for Numeric Nutrient Criteria

Percent FLEPPC exotics

- Calculate the percent invasive exotics as the number of occurrences of FLEPPC Category 1 or 2 in the 100 m reach divided by the total number of taxa occurrences in the 100 m reach.
- Calculations detailed in the SOP
- **LT 7600** table contains nativity status; FLEPPC website has Cat 1 and 2 lists:
<https://www.fleppc.org/list/list.htm>



Guidance for Level of ID

- Species Level ID needed in most cases
- LVI Primer contains guidance on which genera really need to be identified/verified in the lab
- Genus level C of C scores
 - *Hydrocotyle*
 - *Lemna*
 - *Nuphar*
 - *Peltandra*
 - *Typha*



Resources

- 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>

- SOP is available on DEP website here:

<https://floridadep.gov/dear/quality-assurance/content/dep-sops>

- Field form (**FD 9000-32**) is available on DEP website here:

<https://floridadep.gov/dear/quality-assurance/content/sop-forms>