

FS 7300. Macrophyte Sampling

FS 7310. LAKE VEGETATION INDEX (LVI) SAMPLING

This sampling procedure requires specific training and a demonstration of competency due to the expert judgment exercised during field sampling. Each sampling entity must maintain a plant reference collection. See also the following procedures:

- FT 3001 Physical/Chemical Characterization
- FT 1000 General Field Testing and Measurement

1. INTRODUCTION

This method was designed to be a rapid screening tool for ecological condition, by determining how closely a lake's flora resembles that of an undisturbed condition.

2. EQUIPMENT AND SUPPLIES

- Aquatic and wetland plant identification manuals
- GPS unit
- Hand lens
- Binoculars
- Map of lake separated into 12 sections
- Boat
- Implement to measure a 5 m distance
- Frotus
- Plastic bags
- Permanent marker
- Cooler
- Ice
- Lake Vegetation Index Data Sheet
- Completed Physical/Chemical Characterization Field Sheet (FD 9000-3)

3. METHODS

3.1. Prior to visiting the lake:

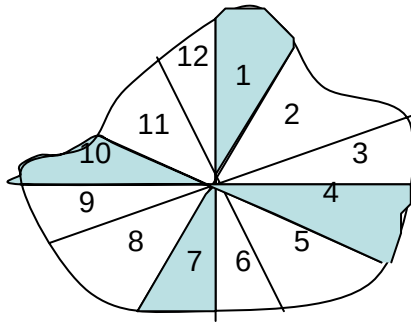
3.1.1. Generate a GIS map of the lake. (An aerial photo is most helpful for locating features on the lake). Divide the lake into four quadrants by drawing a north-south midline and an east-west midline. Then, logically divide the entire lake into twelve total sections (three in each quadrant), with approximately equal shoreline distances and known latitude/longitude coordinates generated from the GIS mapping effort.

3.1.2. Number the sections 1-12 in a clockwise fashion, starting with 1 as the section immediately clockwise from the north-south line in the northeast quadrant.

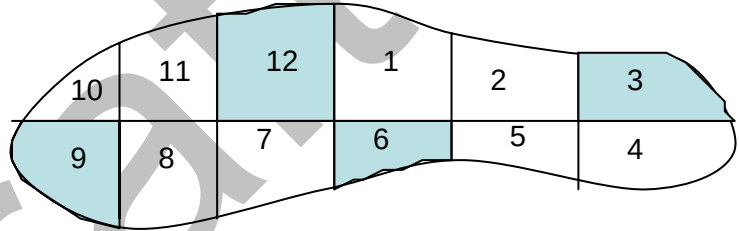
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3.1.3. Using a random numbers table or some other random number generator (e.g. rolling a die), select section 1, 2, or 3 as the starting section.

3.1.4. If section 1 is selected as the starting section, sections 1, 4, 7, and 10 will be sampled. If section 2 is selected, sections 2, 5, 8, and 11 are sampled. If section 3 is selected, sections 3, 6, 9, and 12 are sampled. On the Lake Vegetation Index Data Sheet, record the sections of the lake associated with each sampling unit (data column). There are four sampling units per lake. See figure below for examples of different sampling strategies.



Sampling strategy if 1 is randomly selected. Plants identified in sections 1, 4, 7, and 10 are recorded in individual columns on the data sheet.



Sampling strategy if 3 is randomly selected. Plants identified in sections 3, 6, 9, and 12 are recorded in individual columns on the data sheet.

3.2. In the field:

3.2.1. Note that four data columns will be used on the Lake Vegetation Index Data Sheet for this LVI sampling procedure, resulting in four species lists for the lake. Record the total species from each “drive-by” effort combined with its associated transect portion (to include all five frotus deployments) for each sampling unit as one cumulative species list for the sampling unit. Mark each column on the data sheet to match the sampling unit (see section 3.1.4).

3.2.2. Use the map of the lake and GPS unit to go to the emergent zone of the first sampling unit. Travel at idle or slow speed and record the presence of vascular plant species seen from the boat on the Lake Vegetation Index Data Sheet. Identify plants to the lowest practical taxonomic level. Binoculars may be used to aid in observation. Collect any specimens within easy reach that are not identifiable by observation from the boat. Identify collected specimens, or bag them for return to the lab. Do not leave the boat or spend effort on difficult to access areas. This is a quick “drive-by” survey. Continue this sampling throughout the section.

3.2.3. Identify a location within the sampling unit to set up a transect 5 m in width. Choose a location where you will be able to navigate the boat

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approximately perpendicular to the shoreline. Where possible, choose a location that is species rich and/or contains species which were not identified in the "drive-by" survey. Within the emergent zone, measure 5 m for the width of the transect. Orient the transect perpendicular to the shoreline, with the boat being the centerline of the transect. Record the presence of all plant species within the 5 m belt transect, from the point where floating or emergent plants begin, to the ordinary high water mark of the lake. If practical, get out of the boat and wade, to identify plants that may be small, hidden or in areas too shallow to reach by boat. Record the presence of species in the transect (as described in 3.2.1) on the Lake Vegetation Index Data Sheet.

3.2.4. Deploy the frotus five times per section within the 5 m transect, moving from the shoreline to open water. Record the presence of species from the frotus deployments (as described in 3.2.1) on the Lake Vegetation Index Data Sheet.

3.2.5. Repeat steps 3.2.2-3.2.4 for the other half of the sampling unit.

3.2.6. Determine one dominant or two co-dominant species for the sampling unit by estimating the plant with the largest areal extent. (Dominance can be by emergent, floating, or submersed species.) Record dominance or co-dominance on the Lake Vegetation Index Data Sheet. If no one dominant or two co-dominant species are present, do not assign a dominance code for that sampling unit.

3.2.7. Repeat steps 3.2.2-3.2.6 for the second through fourth sampling units.

3.2.8. Place any specimens that can not be readily identified in the field in plastic bags. Label each bag so that the species name can later be added to the correct sampling unit species list(s). Store bags on ice until returning to the laboratory. Plants kept refrigerated can be identified fresh within a day or two.

3.3. After visiting the lake:

3.3.1. Prepare unknowns for herbarium identification or verification by a consulting botanist as voucher specimens.

3.3.2. Identify and record the correct names of the unknown specimens on the Lake Vegetation Index Data Sheet.

3.3.3. Calculate the LVI score for the lake using the document "Fore, Leska S., Assessing the Biological Condition of Florida Lakes: Development of the Lake Vegetation Index (LVI), 2005."

4. RECOMMENDED REFERENCES FOR PLANT IDENTIFICATION:

Godfrey , R. and J. Wooten. 1979. Aquatic and Wetland Plants of Southeastern United States: Monocotyledons. Univ. Ga. Press, Athens.

Godfrey , R. and J. Wooten. 1979. Aquatic and Wetland Plants of Southeastern United States: Dicotyledons. Univ. Ga. Press, Athens.

Wunderlin, Richard P. 1998. Guide to the Vascular Plants of Florida. University Press of Florida, Gainesville.

Tobe, John T. et. al. 1998. Florida Wetland Plants: An Identification Manual. Florida Department of Environmental Protection, Tallahassee.

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Langeland, K.A. and K. Burks. 1998. Identification and Biology of Non-Native Plants in Florida's Natural Areas. Florida Department of Environmental Protection, Tallahassee.

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