

# Lake Vegetation Index in the Ocklawaha Basin



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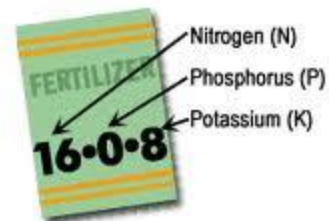
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# What is the LVI?

- The LVI, or Lake Vegetation Index, is DEP's newest tool to assess the long term condition of a lake.
- The LVI demonstrates how closely the plant community resembles one which would be expected in a condition of minimal human disturbance.
- The LVI is based on a rapid field assessment of aquatic and wetland plants as indicators of various effects of human disturbance over time.

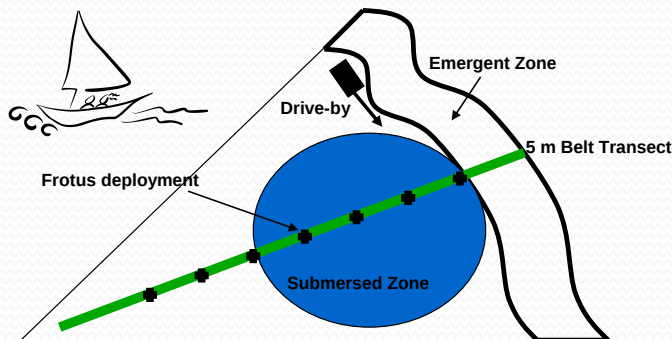
# What is Human Disturbance?



# How is an LVI Performed?



- **Use GIS to map and subdivide the lake**
  - The method requires that the lake be divided into 12 sections, and then 4 sections are sampled. A section is randomly chosen, and then every third section is sampled.
- **Drive-by and transect:**
  - In the four sampled sections, biologist drive by the shoreline and record plant species observed.
  - For the transect, an area of the lake section is heavily scrutinized where there will be a likely addition of species to the list for that section



# How is an LVI Performed?

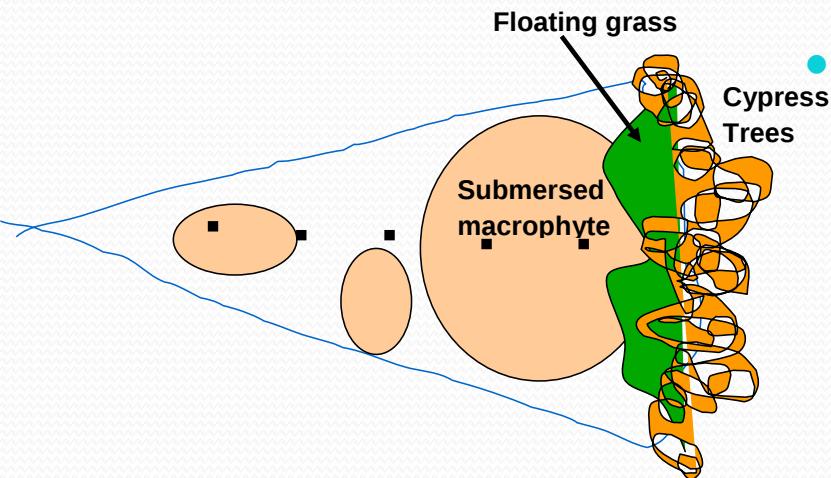


- **Deploying the frotus:**

- A frotus is a double-sided metal rake attached to a rope, and is used to sample submersed aquatic vegetation. The sampling SOP states that the frotus should be thrown at least 5 times within each transect in each of the four sampled lake sections.

- **Determination of dominant or co-dominant plants:**

- Samplers should designate a dominant plant or 2 co-dominant plants in each lake section. Dominance should be determined by areal extent within the lake.



# What Affects an LVI Score?



**Four metrics comprise the index:**

- % native plant species
- % invasive exotic plant species
- % sensitive plant specie (C of C > 7)
- coefficient of conservatism (C of C) of the dominant plant specie or co-dominant plant specie

# What is the Coefficient of Conservatism (C of C)

- The coefficient of conservatism is a number from 0 to 10 that indicates how broad or narrow a plant's ecological niche is, as determined by expert botanists.
- Exotic and ubiquitous weedy native plant species have low C of C scores.
  - Cat tails, Primrose Willow and Dog Fennell
- Native plant species that display fidelity to a particular community and are sensitive to disturbance have high C of C scores.
  - St John's wort, Eel grass and saw grass

# What are The Current LVI Thresholds?

|                             |        |                                                                                                                                                                                                                    |
|-----------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Category 1<br>“exceptional” | 78–100 | Nearly every macrophyte present is a species native to Florida, invasive plants typically not found. About 30% of plants present are identified as sensitive to disturbance and most plants have C of C values >5. |
| Category 2<br>“healthy”     | 38–77  | About 85% of plant species are native to Florida; invasive species present. Sensitive plants have declined to about 15% and C of C values average about 5.                                                         |
| Category 3<br>“impaired”    | 0–37   | About 70% of plant species are native to Florida. Invasive plants may represent a 1/3 of total species or more. Less than 10% of the plants are sensitive and C of C values of most species are <4.                |

# Ocklawaha Basin Lakes and Scores

| Location     | 2010 LVI Score |            | 2011 LVI Score | Category   |
|--------------|----------------|------------|----------------|------------|
| Trout Lake   | 34             | 3 Impaired | 33             | 3 Impaired |
| Lake Apopka  | 43             | 2 Healthy? | 42             | 2 Healthy? |
| Beauclaire   | 40             | 2 Healthy? | 42             | 2 Healthy? |
| Carlton      | 46             | 2 Healthy  | 30             | 3 Impaired |
| Lake Eustis  | 50             | 2 Healthy  | 33             | 1 Impaired |
| Lake Harris  | 61             | 2 Healthy  | 50             | 2 Healthy  |
| Lake Griffin | 61             | 2 Healthy  | 59             | 2 Healthy  |

# What Are the Proposed Thresholds?

|                             |        |
|-----------------------------|--------|
| Category 1<br>“exceptional” | 78–100 |
| Category 2<br>“healthy”     | 46–77  |
| Category 3<br>“impaired”    | 0–45   |

FDEP has plans to expand the range of Impaired to 0 - 45

# Conclusion

- The Lake Vegetation Index has a direct correlation with human disturbance
- LVI data must be interpreted in conjunction with other supporting data such as Chlorophyll a and phytoplankton.

A photograph of a pond with several yellow lotus flowers in bloom. The flowers have bright yellow petals and centers. They are surrounded by large, green lily pads and many brown, dried lotus seed pods. The background is a dense field of green grass and more lotus plants. The word "Questions?" is written in white text across the center of the image.

# Questions?

<http://www.dep.state.fl.us/central/>

<http://publicfiles.dep.state.fl.us/dear/sas/sopdoc/2008sops/fs7000.pdf>