

LVI Stressor ID Discussion

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BIOCRITERIA MEETING

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LVI Impairments

- ▶ Impaired for LVI and numeric nutrient criteria (NNC) – Category 5 (verified impaired with nutrients as causative pollutant)
- ▶ Impaired for LVI but not NNC – Category 4(d) Study List (verified impaired but no causative pollutant)
- ▶ Conduct Stressor ID to determine causative pollutant (or other causes of LVI failures)

Discussion Objective

- ▶ Currently no process to determine cause of failing LVI
- ▶ New effort to develop evaluation process
- ▶ Review draft list of stressors
- ▶ Identify available information to quantify stressors
- ▶ What are we missing? What can samplers add?
- ▶ Feedback welcome!

Current 4(d) Lakes

WBID	Water Segment Name
1472B	LAKE HATCHINEHA
1573C	LAKE ROSALIE
2893Y	Lake Winder
2991D	HORSESHOE LAKE (SOUTH)
3169A2	LAKE TYLER
1521G1	Spring Lake
1807B	Lake Manatee Reservoir
2998D	Lake Marion
3009I	Garden Lake
3168H	Lake Holden
3183B	Lake Kissimmee
3183G	Lake Jackson (Osceola County)

Stressor ID Process Overview

- ▶ Identify factors that could cause:
 - ▶ Invasive exotic species to increase;
 - ▶ Native species to decrease; and/or
 - ▶ Sensitive species to decrease or be absent.
- ▶ Determine how to evaluate those factors (stressors) for a given lake
- ▶ Estimate what levels of stressors could cause decline in macrophyte community health (literature info?)
- ▶ Develop weight of evidence approach to evaluate potential stressors contributing to LVI failure at a given lake

Potential Stressors

- ▶ Stormwater inputs
- ▶ Light limitation
- ▶ Water level control
- ▶ Connectivity to other impaired waters
- ▶ Lakeside alterations/lack of buffer
- ▶ Mode of entry for exotic plants (incl. boat ramps)
- ▶ Overgrazing by fish (potentially introduced)
- ▶ Lawn fertilization
- ▶ Lake fertilization

Sources of Information – DEP

- ▶ SBIO - Plant taxa lists, including historical data
- ▶ SBIO - Lake observation information from Lake Habitat Assessment or Lake Observation Form
 - ▶ Stormwater Inputs
 - ▶ Lakeside Alteration
 - ▶ Buffer Zone

Sources of Information – DEP

- ▶ Landscape Development Intensity (LDI) index (many in SBIO)
- ▶ Field sheet observations
 - ▶ Vegetation management
 - ▶ Exotic apple snails
 - ▶ Periphyton abundance
 - ▶ Observations of sediment, clarity



Lake Observation Field Sheet

DEP FORM FD 9000-31: LAKE OBSERVATION FIELD SHEET

SAMPLE ID: _____ MACROPHYTE ID: _____ LATITUDE: _____
 COUNTY: _____ STORET #: _____ LONGITUDE: _____
 DATE: _____ TIME: _____ SAMPLING AGENCY: _____
 SITE NAME: _____ WBID: _____
 FIELD ID/NAME: _____ LAKE SIZE: _____ RQ: _____

WATERSHED / LAKESIDE FEATURES

PREDOMINANT LAND-USE IN WATERSHED (specify relative percent in each category – from GIS) :															LANDSCAPE DEVELOPMENT INTENSITY (100 m buffer)						
Forest/Natural	Silviculture	Field/Pasture	Agricultural	Residential	Commercial	Industrial	Other (Specify)								LDI:	Land Use Source & Year:					
Local Watershed Erosion (select one) : ☐ None ☐ Slight ☐ Moderate ☐ Heavy										Artificially Impounded											
Local Watershed NPS Pollution : ☐ No evidence ☐ Slight ☐ Moderate ☐ Heavy										☐ Yes ☐ No											
STORMWATER INPUTS _____		Stormwater enters system via sheet flow over non-cultivated and/or natural vegetation					Some direct stormwater inputs (ditches, pipes, cultivated vegetation < 10%) but good BMPs in place					Moderate direct inputs of stormwater (ditches, pipes, cultivated vegetation 11%-50%) but few BMPs in place					Much direct input of stormwater (ditches, pipes, cultivated vegetation > 51%) and no or ineffective BMPs in place				
		20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
LAKESIDE ALTERATIONS _____		Very few man-made structures, roads, or other disturbance adjacent to lake (<10% lakeside affected)					Moderate disturbance visible - structures, roads or other (10%-49% lakeside affected)					Many structures, roads or other human disturbance visible (50%-70% lakeside affected)					Highly developed or disturbed (>70% of lakeside affected)				
		20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
BUFFER ZONE _____		Expected native vegetation between uplands and littoral zone, greater than 90% of shore with >18 m buffer					89%-51% of shoreline with >18m buffer or >75% with 10m to 18m buffer					50%-30% of shoreline with >18m buffer or 50%-74% with 10m to 18m buffer					< 29% of shoreline with >18m buffer				
		20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

Stormwater Inputs

- ▶ Observations of stormwater input (Lake Observation Form or Lake HA)
- ▶ Turbidity data
- ▶ Sediment composition – high proportion of fine clay can indicate stormwater input (depends on surrounding soil types)



Light Limitation

- ▶ Submersed plant community absent?
- ▶ Submersed plant community dominated by shade tolerant plants?
- ▶ Water clarity data
 - ▶ Secchi
 - ▶ Color
 - ▶ Turbidity
 - ▶ Chlorophyll *a*



Lake Management

- ▶ Invasive plant management by FWC (recent management info on website)
- ▶ Knowledge of lake fertilization
- ▶ Presence of fish feeders
- ▶ Introduction of fish (e.g., carp) and information about relative success



Physical Disturbance

- ▶ Presence of boat ramp
- ▶ Recreational pressure
- ▶ Observations of plant removal by lakeside homeowners
- ▶ Water level control



Others?

