Lake Okeechobee Performance Measure
Nearshore Region Submerged Aquatic Vegetation Coverage

Last Date Revised: October 20, 2016

Acceptance Status: Accepted

1.0 Desired Restoration Condition

Submerged aquatic plant communities – The annual summer (July/August) peak SAV coverage target is to have 50% of the entire 100,000 acre nearshore zone, out to the 5.5 ft contour, vegetated by either vascular or non-vascular (*Chara* sp.) SAV. The IG (interim goal) is to have at least 35% of this potentially colonize-able area vegetated with vascular and non-vascular (*Chara* sp.) SAV during the peak summer growing season (July/August) in all years after a sufficient amount of additional watershed storage is developed and a regulation schedule is implemented to more consistently keep the lake in the ecologically beneficial stage envelope during the summer months.

1.1 Predictive Metric and Target

1.2 Assessment Parameter and Target –Acres of SAV colonized nearshore area. Fifty thousand, (50,000) acres of SAV at annual peak summer coverage; equal to 50% of the nearshore potentially colonize-able area.

2.0 Justification

The revised Lake Okeechobee submerged aquatic vegetation (SAV) percent coverage performance measure is based on the furthest offshore elevation contour at which non-vascular SAV has been found. Therefore under ideal growth conditions, SAV would be expected to cover all of the nearshore region between the inshore 12 ft elevation contour (the approximate offshore edge of emergent vegetation in the nearshore region) to approximately the offshore 5.5 ft elevation contour (Figure 1). The 5.5 ft elevation contour corresponds to the furthest offshore point at which SAV (*Chara* sp.) has been found during the past 15 years of summer SAV sampling. SAV coverage is an important performance measure for Lake Okeechobee because submerged vegetation provides habitat for fish, macroinvertebrates, zooplankton and other aquatic taxa and also provides a substrate for epiphytic periphyton, which competes with phytoplankton for water column nutrients, thereby indirectly reducing phytoplankton biomass and potential bloom formation.

The proposed targets are based on the past 15 years of Lake Okeechobee SAV data. Between 2001 and 2015, SAV coverage during summer SAV mapping in non-hurricane impact years (all years except for 2005 and 2006) has varied between 21% (2003) and 52% (2009) of the potential colonizable nearshore area. The average non-hurricane impact mean annual SAV coverage has been 36% of the potentially colonize-able area. This contrasts with the SAV portion of the current Lake Okeechobee vegetation mosaic performance measure, which, in the absence of monitoring data, was based exclusively on estimates of the potential depth of the photic zone and best professional judgment.

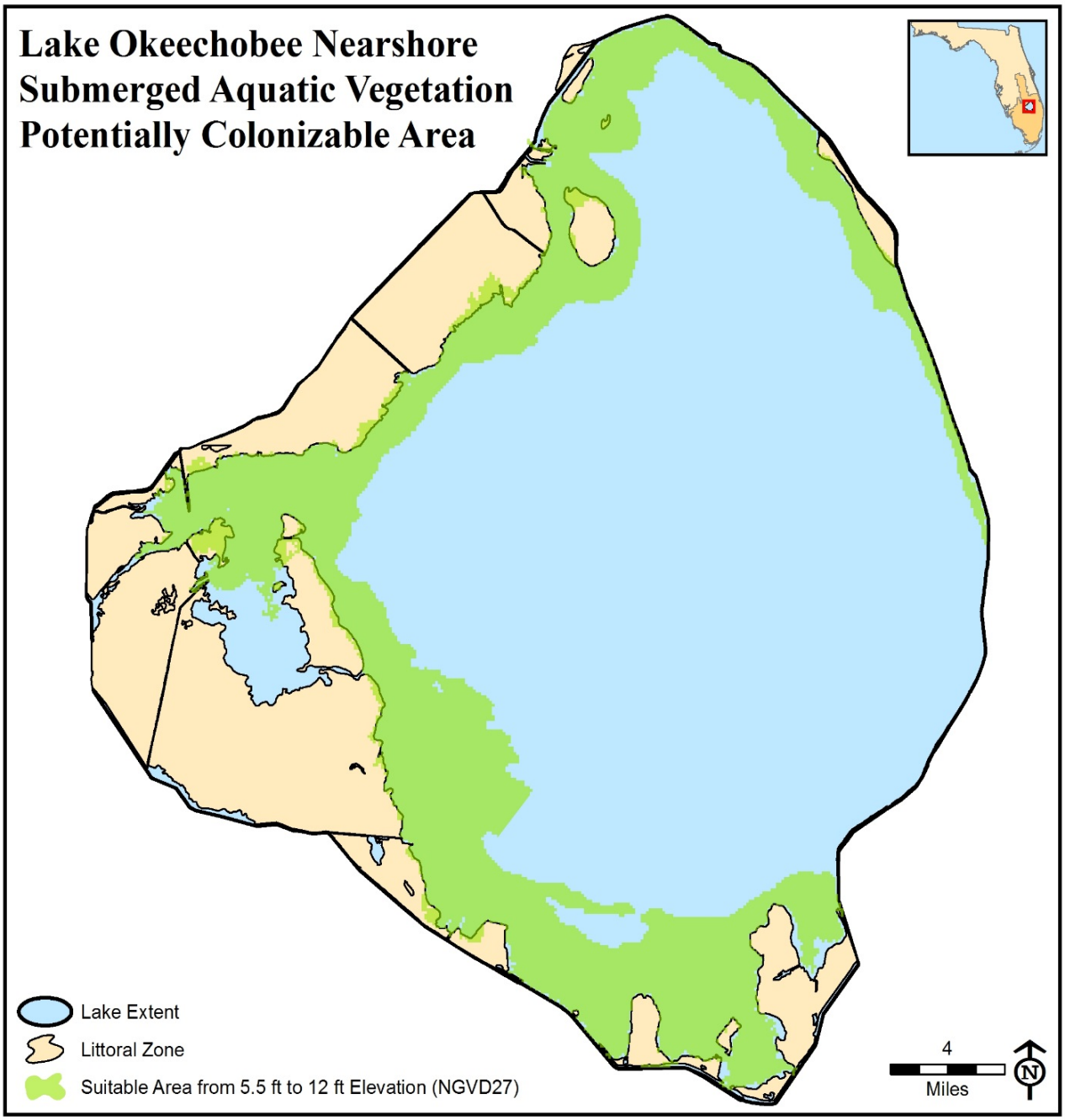

Figure 1. Nearshore green colored area is potentially colonizable by submerged aquatic vegetation (SAV). The potentially colonizable area is approximately 100,000 acres.

3.0 Scientific Basis

3.1 Relationship to Conceptual Ecological Models

The indicator for this performance measure is the annual summer percent cover of SAV relative to the potentially colonize-able nearshore area as it relates to the following conceptual ecological models.

Regional Models

Lake Okeechobee Conceptual Ecological Model: Section 9.4.3 Submerged Aquatic Vegetation (SAV) Conceptual Model.
Ecological Communities and Effects of Water Stages Conceptual Ecological Model.

3.2 Relationship to Adaptive Assessment Hypothesis Clusters

Ecological Premise: When lake elevations are within the ecologically preferred stage envelope of 12.5-15.5 ft NGVD, with an annual fluctuation between the May end of the dry season low (12.5 ft NGVD) and the October end of the wet season high (15.5 ft NGVD), SAV coverage should at least meet the IG of 35% coverage of the potentially colonize-able nearshore area of 100,000 acres. Conversely, when lake stages are either above the ecologically beneficial stage envelope for any length of time, or below the ecologically beneficial stage envelope for an extended period of time (>3 months), a reduction of SAV nearshore areal coverage is expected. Consistently achieving or exceeding the 50% coverage target is dependent on both maintaining the appropriate stage conditions and improving water quality such that light penetration remains high in the nearshore zone at all times.

CERP Hypotheses: Keeping lake stages in the ecologically beneficial stage envelope and minimizing the occurrence of water levels above and below the ecologically beneficial stage envelope, especially during the spring and summer months coupled with improvements in water quality and transparency will maximize the potential for nearshore SAV to colonize the largest amount of potentially colonize-able nearshore area during the peak summer growing season.

4.0 Evaluation Application

4.1 Evaluation Protocol

This PM cannot be used as an evaluation tool for any alternative scenarios in plan formulation since current model output only provides Lake Okeechobee stage hydrograph data, which is not a relevant input for this performance measure. Lake stage hydrograph data also cannot be used with this PM to predict that the IG of at least 35% of the potential maximum nearshore SAV areal coverage will be achieved.

4.2 Normalized Performance Output

4.3 Model Output

5.0 Monitoring and Assessment Approach

5.1 MAP Module and Section

Additional background Lake Okeechobee SAV information can be found in the *CERP Monitoring and Assessment Plan: Part 1 Monitoring and Supporting Research* - Lake Okeechobee Module section 3.4.3.2 (RECOVER 2004a). The long-term annual summer nearshore mapping project described therein results in the development of an annual map that shows the spatial extent of nearshore SAV coverage.

5.2 Assessment Approach

Determine the annual acres of summer nearshore SAV coverage from the annual nearshore SAV mapping data and compare this coverage to the potentially colonizable nearshore SAV area and calculate the percent nearshore summer SAV coverage. Also, compare the annual summer nearshore SAV percent coverage to the target and IG values.

For the biannual SAV stoplight report, the annual percent nearshore SAV coverage is used to generate a stoplight value. The green stoplight color will be used when the annual summer nearshore SAV percent coverage meets or exceeds the target value of 50%, the yellow stoplight color will be used when the annual summer nearshore SAV percent coverage is greater than or equal to the IG value of 35% but less than 50%. The red stoplight color will be used when the annual summer nearshore SAV percent coverage is less than the IG value.

6.0 Future Tool Development Needed to Support Performance Measure

6.1 Evaluation Tools Needed

This PM can only be used as an assessment tool, so no evaluation tools and IG predictive tools can be developed since this PM cannot be used as an evaluation tool.

6.2 Assessment Tools Needed

Continuation of the current annual Lake Okeechobee summer nearshore SAV mapping project to provide data needed to conduct this assessment.

7.0 Notes

This Performance Measure is a revision of the Lake Okeechobee Performance Measure Vegetation Mosaic – Submerged Plant Communities (Last Date Revised: Mar 7, 2007).

8.0 Working Group Members

Rich Botta (SFWMD)
Bruce Sharfstein (SFWMD)
Andy Rodusky (SFWMD)
Steve Schubert (USFWS)

9.0 References

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