



**Florida Department of Environmental Protection**

# **Writing an Ecosummary**

**May 18, 2017**





# Ecosummary 101

***What is an Ecosummary?*** A concise report that summarizes WQ and biological data for a waterbody, and indicates whether water quality criteria are met

***Why use the Ecosummary format?*** It provides a standardized, user- and reader-friendly blueprint for conveying scientific and DEP water rule information, and can be used with various project objectives. AEQAS has developed two templates—one for streams, another for lakes



# Ecosummary 101

***For what types of projects should I be writing an Ecosummary?*** Anytime you want to report on results from one waterbody, have at least two temporally independent sampling events, but not a much more extensive scope.

- Strategic Monitoring Program
- Reference Stream and Lake Surveys
- Status and Trends Monitoring
- Homeowner requests
- Natural Background DO demonstration
- BMAP or restoration monitoring



# Ecosummary 101

***When should I not use the Ecosummary?*** A long term study or study with a broad spatial scope (e.g. low water study, basin study). Elements can be borrowed and included in a longer format report.

***Who is the target audience for an Ecosummary?***  
Multiple readers: interested public, landowners and managers, regulated parties, other DEP programs, other government entities

# Stream Ecosummary

## ✓ Fill in red sections

- For some items, fill in the information, for others choose an option; some examples are provided
- Remember to delete portions that do not apply

## ✓ Sections

1. Title/Abstract
2. Background
3. Methods
4. Results
5. Conclusions



## STREAM ECOSUMMARY

[Site Name (e.g., "Rice Creek Upstream of SR 100")], [WBID], [County],  
[Sampling dates]

[site picture (optional)]

Figure 1. Sampling reach along the [Site Name] in [x] County.

Physical, chemical, and biological sampling was conducted at [site name] (STORET ~~xxxxx~~, SBIO Nickname) in [x] County on [sampling date and date] by [samplers] of the DEP [Tallahassee or x DEAR Field] Office. This stream was sampled [ "as part of strategic monitoring program" or "in response to a homeowner request," "NPDES assessment", "to determine if the observed low dissolved oxygen values are natural and result in full support of aquatic life uses" etc.]. Overall, the water quality and macroinvertebrate community data indicated that the stream [met/did not meet/or, if inconclusive, provide further explanation] expectations for a healthy, well-balanced stream.

### Background

Healthy, well-balanced stream and river communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of nuisance (generally exotic) plants and

animals. DEP evaluates if human activities have resulted in the condition where a waterbody has exceeded water quality criteria (Chapter 62-302, Florida Administrative Code), including whether adverse impacts to biological communities have occurred. DEP water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life use support), and exceedances of these standards is associated with interference with the designated use. Additionally, DEP evaluates the health of floral (plants and algae) and faunal (animal) communities and conducts habitat assessments to diagnose potential physical impacts.

### Site Description

[Include relevant description of site and location, including map. Suggested text below.]

The [site name] sampling location (Figure 1) is located [location description] in the [watershed name] Watershed (WBID [x], Figure 2). It is a [first, second, etc] order stream draining the Gulf Coast Flatwoods, a subecoregion of the Southern Coastal Plain ecoregion. The [site name] is a tributary of [receiving water] that flows into [receiving estuary or larger water body] and has a Landscape Development Intensity (LDI) Index score of [site LDI score]. The LDI quantifies the intensity of human activity in the surrounding area based on land use and land cover, and is normalized on a scale from 1 to 10, where a natural land use has a coefficient of 1.0 and a central business district has a coefficient of 10.0. This site's score of [site LDI score] suggests [minimal, moderate, heavy] human activity in the 100m buffer surrounding the stream. The WBID is currently listed for [include any listed parameters on most recent verified list] on the Impaired Waters Verified List (date of list). Additional information about this WBID is available in the TMDL Tracker application (<http://webapps.dep.state.fl.us/DearTmdl/tmdlReportAction.do?method=report>).

Figure 2. Location of [Site Name] in [x] County. [put figure captions below figures]

# 1. Title/Abstract

- ✓ Be specific with your site name (include a road crossing or location)
- ✓ Include two, temporally independent samples
- ✓ Include a picture
- ✓ Include the purpose of the sampling (SMP, Reference Stream Survey, NPDES assessment, Status and Trends Monitoring, etc;)

## STREAM ECOSUMMARY

**[Site Name (e.g., “Rice Creek Upstream of SR 100”)], [WBID], [County], [Sampling dates]**

**[site picture (optional)]**

Figure 1. Sampling reach along the [Site Name] in [x] County.

Physical, chemical, and biological sampling was conducted at [site name] (STORET ~~xxxxxx~~, SBIO Nickname) in [x] County on [sampling date and date] by [samplers] of the DEP [Tallahassee or x DEAR Field] Office. This stream was sampled [ “as part of strategic monitoring program” or “in response to a homeowner request,” “NPDES assessment”, “to determine if the observed low dissolved oxygen values are natural and result in full support of aquatic life uses” etc.]. Overall, the water quality and macroinvertebrate community data indicated that the stream [met/did not meet/or, if inconclusive, provide further explanation] expectations for a healthy, well-balanced stream.

## 2. Background

Explains generally how human stressors can result in waterbody degradation, adverse biological impacts, and interference with the designated use

- ✓ Include site description with detailed location and map
- ✓ Include LDI score (in Station Visit Module in SBIO2)
- ✓ Check Impaired Waters Verified list for listed parameters  
<http://www.dep.state.fl.us/water/watersheds/assessment/>  
(Kevin O'Donnell)

### Background

Healthy, well-balanced stream and river communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and animals. DEP evaluates if human activities have resulted in the condition where a waterbody has exceeded water quality criteria (Chapter 62-302, Florida Administrative Code), including whether adverse impacts to biological communities have occurred. DEP water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life use support), and exceedances of these standards is associated with interference with the designated use. Additionally, DEP evaluates the health of floral (plants and algae) and faunal (animal) communities and conducts habitat assessments to diagnose potential physical impacts.

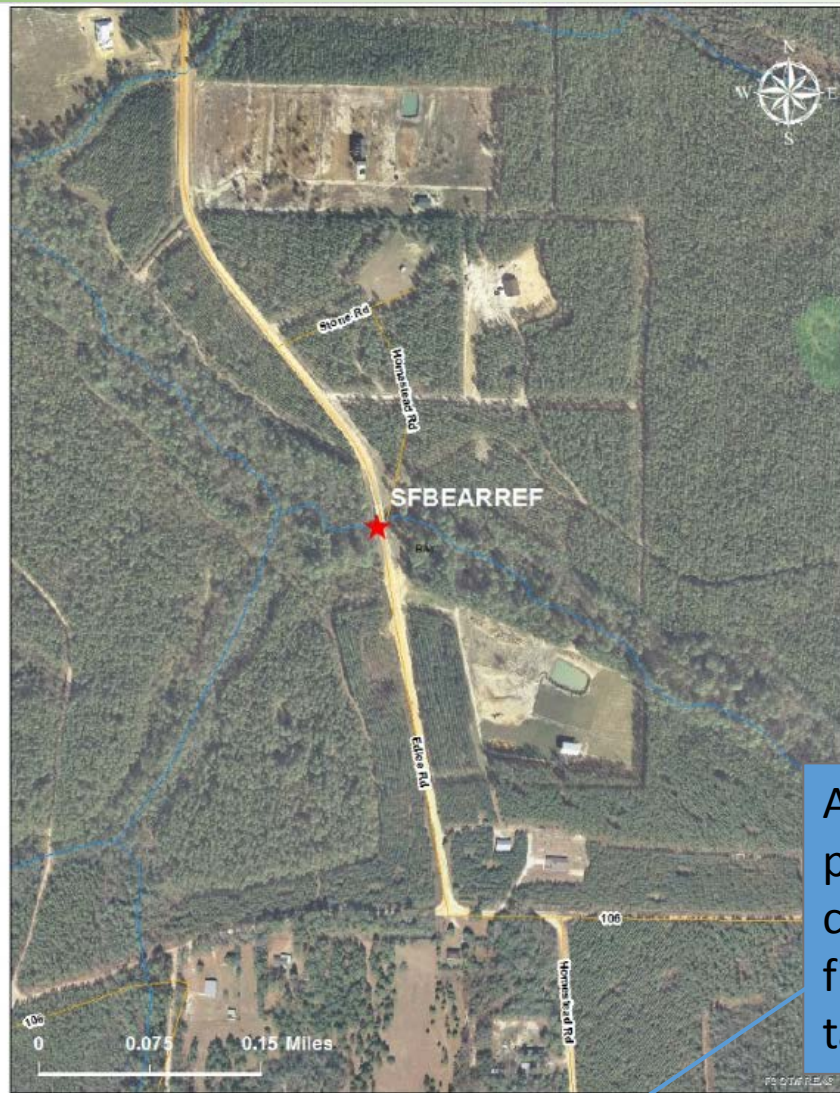
### Site Description

[Include relevant description of site and location, including map. Suggested text below.]

The [site name] sampling location (Figure 1) is located [location description] in the [watershed name] Watershed (WBID [x], Figure 2). It is a [first, second, etc] order stream draining the Gulf Coast Flatwoods, a subecoregion of the Southern Coastal Plain ecoregion. The [site name] is a tributary of [receiving water] that flows into [receiving estuary or larger water body] and has a Landscape Development Intensity (LDI) Index score of [site LDI score]. The LDI quantifies the intensity of human activity in the surrounding area based on land use and land cover, and is normalized on a scale from 1 to 10, where a natural land use has a coefficient of 1.0 and a central business district has a coefficient of 10.0. This site's score of [site LDI score] suggests [minimal, moderate, heavy] human activity in the 100m buffer surrounding the stream. The WBID is currently listed for [include any listed parameters on most recent verified list] on the Impaired Waters Verified List (date of list). Additional information about this WBID is available in the TMDL Tracker application (<http://webapps.dep.state.fl.us/DearTmdl/tmdlRepoAction.do?method=report>).

**Figure 2. Location of [Site Name] in [x] County.** [put figure captions below figures]

# Example maps



Always  
provide  
captions for  
figures and  
tables!

**Figure 2.** Location of South Fork of Bear Creek in Bay County.



**Figure 1.** Location of Alexander Springs Creek at CR 445 in Lake County.

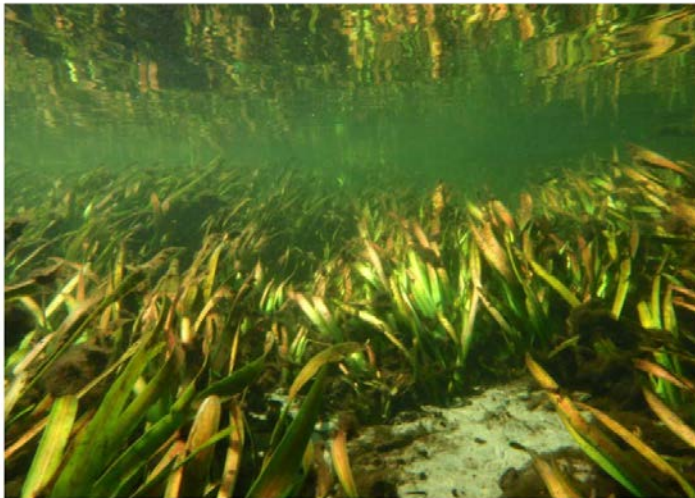
# Example photos



**Figure 2.** Alexander Springs Creek below CR 445 bridge



**Figure 1.** BioRecon Index site for Live Oak Creek above Eglin Road 234 on 02/26/2008.



**Figure 3.** *Vallisneria americana* (eelgrass) in the sampling reach at Alexander Springs Creek.



**Figure 3.** Eglin Range B-70 bridge bomb target site on Live Oak Creek.

# 3. Methods

## ✓ Water Quality

- ✓ Include list of parameters (e.g. nutrients, turbidity, color, metals, microbiology)
- ✓ Specify if Class other than III
- ✓ Template language includes explanation of NNC; NNC information and nutrient regions found here:  
<http://www.dep.state.fl.us/water/wqssp/nutrients/index.htm>

## ✓ Dissolved Oxygen

- ✓ Template includes explanation of DO criteria; include DO region (same as SCI bioregion)
- ✓ If DO SSAC applies, include info and link to DO TSD
- ✓ Include optional template language if sampling for natural background DO study

## ✓ Habitat Assessment

- ✓ Template language includes scoring categories

## ✓ Floral Assessment

- ✓ Template language includes description of LVS and RPS, and a link to the Implementation document, which explains how to interpret the results for NNC

## ✓ Faunal Assessment

- ✓ Template language includes description of SCI, and its role in WQS and IWR rules.
- ✓ Delete Biorecon if not using
- ✓ **NNC exclusions for systems that don't meet the stream definition—making this determination**

# 4. Results

- ✓ Water Quality
  - ✓ Results go in table
  - ✓ Highlight or note exceedances, and describe, to the extent possible, whether due to natural conditions or human disturbance
  - ✓ Use data qualifier codes where applicable and define below table
- ✓ NNC Thresholds
  - ✓ Indicate whether thresholds were met for these sampling events, with acknowledgement that compliance is based on AGMs (min 4 samples, 1 in 3 exceedance)

**Table 1.** Water quality results from June 25, 2014 and May 4, 2016 at South Fork Bear Creek.

| Analyte                               | Result<br>6/25/14 | Result<br>5/4/16 | Applicable<br>Class III Water<br>Quality<br>Criteria           |
|---------------------------------------|-------------------|------------------|----------------------------------------------------------------|
| Field Temperature (°C)                | 21.65             | 20.5             |                                                                |
| Field pH (SU)                         | 4.47              | 5.87             | Within 1 SU of natural background                              |
| Field Dissolved Oxygen (% saturation) | 83                | 84               | Panhandle West: no more than 10% of daily avg values below 67% |
| Field Specific Conductance (µmhos/cm) | 93 J              | 42               | 50% above background or 1,275 µmhos/cm, whichever is greater   |
| Alkalinity (mg CaCO <sub>3</sub> /L)  | 1.2 I             | 11               | Shall not be depressed below 20                                |
| Color (PCU)                           | 120               | 93               | N/A                                                            |
| Total Phosphorus (mg/L) as P          | 0.009             | 0.008            | *Panhandle West: 0.06 mg/L                                     |
| Nitrate+Nitrite (mg/L) as N           | 0.023             | 0.04             | 0.35 mg/L for spring vents only                                |
| Ammonia (mg/L) as N                   | 0.005             | 0.004 I          |                                                                |
| Total Kjeldahl Nitrogen (mg/L) as N   | 0.43              | 0.18 I           | N/A                                                            |
| Total Nitrogen (mg/L) as N            | 0.45              | 0.22             | *Panhandle West: 0.67 mg/L                                     |

\* Annual geometric numeric nutrient threshold for Panhandle West nutrient region, used in combination with information on flora and fauna.

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

J - Estimated value.

U - Indicates that the compound was analyzed for but not detected.

## 4. Results, continued

- ✓ Floral Assessment
  - ✓ Does it attain the floral component? (it must to attain NNC)
- ✓ Habitat Assessment
  - ✓ Scores and discussion of HA components included in text of report; historic info if applicable
- ✓ Faunal Assessment
  - ✓ Discussion in text; include designation: “exceptional” (>64), “healthy” (>40), or “impaired” (<40)
  - ✓ Compare to previous scores for the site (SCI version 2012 **only**)
  - ✓ Describe why system did or did not meet “healthy” expectation

**Table 3.** Floral and faunal assessment results from 04-07-2014 sampling of Mill Log Creek at three sites.

| Floral/Faunal Metric                   | Evidentiary Threshold of No Imbalances                                                                | Upstr.           | Test             | Down.            |
|----------------------------------------|-------------------------------------------------------------------------------------------------------|------------------|------------------|------------------|
| LVS<br>C of C (mean score)             | Site average $\geq$ 2.5                                                                               | <2m <sup>2</sup> | <2m <sup>2</sup> | <2m <sup>2</sup> |
| LVS FLEPPC (%)                         | Site average < 25%                                                                                    | <2m <sup>2</sup> | <2m <sup>2</sup> | <2m <sup>2</sup> |
| RPS (%)                                | < 25% rank 4-6 (algae > 6 mm thick) coverage. If 20 to 25 % rank 4-6 coverage, evaluate algal species | 0%               | 0%               | 0%               |
| Chlorophyll <i>a</i> (corrected; µg/L) | < 3.2 µg/L. If 3.2 to 20 µg/L, site specific evaluation                                               | 1.5 I            | 1.3 I            | 1.7 I            |
| SCI                                    | Average $\geq$ 40, not any one < 35                                                                   | 65               | 48               | 44               |

I Indicates the value was above the minimum detection limit but below practical quantitation level

# 5. Conclusions

✓ Choose a conclusion category and expand on the provided language in the template:

1. **Meeting Designated Use**—SCI scores indicate a healthy macroinvertebrate community and floral components indicate no imbalance in vascular plant, periphyton, and phytoplankton communities
2. **Not Meeting Designated Use**—SCI scores and/or floral assessments indicate impaired conditions. Mention any planned follow-up
3. **Inconclusive**—e.g. when it is discovered that stream is intermittent/antecedent hydrologic conditions were not met or waterbody type wrong, so SCI results cannot be attributed to water quality
4. **DO example**—low DO regime appears to be a natural condition, based on healthy biological community (SCI scores) and watershed and stream corridor LDI scores

# Lake Ecosummary

✓ 4.5 page template

✓ Fill in red sections

- some choices and examples are given
- delete portions that do not apply

✓ Sections

1. Title/Abstract
2. Background
3. Methods
4. Results
5. Conclusions



## LAKE ECOSUMMARY

[Lake Name], [WBID], [County], [Sampling dates]

[site picture (optional)]

Figure 1. [Site Name] in [x] County. [put figure captions below figures]

DEP conducted water quality and biological sampling at [name of Lake] (STORET xxxxxx, [SBIO Nickname]) in [x] County on [sampling date and date] to assess attainment of designated uses. [This lake was sampled "as part of a strategic monitoring program," "as part of a statewide random sampling network," "as part of a reference lake sampling project," or "in response to a homeowner request"]. Overall, the water quality and plant community data indicated that the lake [met/did not meet/or if, inconclusive, provide further explanation] expectations for a healthy, well-balanced lake.

### Background

Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in lake degradation. Human stressors include increased inputs of nutrients, sediments and/or pesticides from watershed runoff, undesirable removal of native shoreline and/or upland buffer vegetation, and introduction of nuisance (generally exotic) plants and animals. DEP has methods to evaluate if human activities have resulted in a specific waterbody exceeding water

quality criteria (Chapter 62-302, Florida Administrative Code [F.A.C.]), including whether adverse impacts to biological communities have occurred. DEP water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life support), and exceedances of these standards are associated with interference with the designated use. DEP assesses the health of plant communities in Florida lakes, as one indication of whether adverse impacts to biological communities have occurred.

### Site Description

[Include relevant description of site and location, including map. Reference Figures 1 and 2 within the text.]

Figure 2. Location of [Site Name] in [x] County. [put figure captions below figures]

The predominant land uses surrounding [lake name] are [LU 1], [LU 2], and [LU 3]. This lake is/is not currently listed for [include any listed parameters on most recent verified list] on the Impaired Waters Verified List (date of list). Additional information about this WBID is available in the TMDL Tracker application (<http://webapps.dep.state.fl.us/DearTmdl/tmdlReportAction.do?method=report>).

[Insert additional discussion, photos, or anything you think would be informative for the audience. If there is relevant historical information, include it here, e.g., graph of chlorophyll *a* or LVI over time, discussion of past results, and indication of whether or not the site is on the TMDL list for anything, with a link to TMDL tracker.]

### Methods

#### Water Quality

This lake was sampled on [date and date] by the DEP [Tallahassee office or X Regional Operations Center (ROC)]. Surface water [or other depth] samples were collected from the center of the lake [or other location if different] for analysis of [List analytes here (nutrients,

# 1. Title/Abstract

- ✓ Include two, temporally independent samples
- ✓ Include a picture
- ✓ Include the purpose of the sampling (SMP, Reference Lake Survey, Status Monitoring, etc)
- ✓ Indicate if lake met or did not meet healthy biological expectations



## LAKE ECOSUMMARY

[Lake Name], [WBID], [County], [Sampling dates]

[site picture (optional)]

Figure 1. [Site Name] in [x] County. [put figure captions below figures]

DEP conducted water quality and biological sampling at [name of Lake] (STORET xxxxxxx, [SBIO Nickname]) in [x] County on [sampling date and date] to assess attainment of designated uses. [This lake was sampled "as part of a strategic monitoring program," "as part of a statewide random sampling network," "as part of a reference lake sampling project," or "in response to a homeowner request"]. Overall, the water quality and plant community data indicated that the lake [met/did not meet/or if, inconclusive, provide further explanation] expectations for a healthy, well-balanced lake.

## 2. Background

Explains generally how human stressors can result in waterbody degradation, adverse biological impacts, and interference with the designated use

- ✓ Include site description, including lake size. Location map and the LVI sampling map are both recommended
- ✓ Photos and historical information are very helpful
- ✓ Include LDI score (in Station Visit Module in SBIO2)
- ✓ Check Impaired Waters Verified list for listed parameters  
<http://www.dep.state.fl.us/water/watersheds/assessment/>  
(Kevin O'Donnell)

### Background

Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in lake degradation. Human stressors include increased inputs of nutrients, sediments and/or pesticides from watershed runoff, undesirable removal of native shoreline and/or upland buffer vegetation, and introduction of nuisance (generally exotic) plants and animals. DEP has methods to evaluate if human activities have resulted in a specific waterbody exceeding water

quality criteria (Chapter 62-302, Florida Administrative Code [F.A.C.]), including whether adverse impacts to biological communities have occurred. DEP water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life support), and exceedances of these standards are associated with interference with the designated use. DEP assesses the health of plant communities in Florida lakes, as one indication of whether adverse impacts to biological communities have occurred.

### Site Description

[Include relevant description of site and location, including map. Reference Figures 1 and 2 within the text.]

Figure 2. Location of [Site Name] in [x] County. [put figure captions below figures]

The predominant land uses surrounding [lake name] are [LU 1], [LU 2], and [LU 3]. This lake **is/is not** currently listed for [include any listed parameters on most recent verified list] on the Impaired Waters Verified List (**date of list**). Additional information about this WBID is available in the TMDL Tracker application (<http://webapps.dep.state.fl.us/DearTmdl/tmdlReportAction.do?method=report>).

[Insert additional discussion, photos, or anything you think would be informative for the audience. If there is relevant historical information, include it here, e.g., graph of chlorophyll *a* or LVI over time, discussion of past results, and indication of whether or not the site is on the TMDL list for anything, with a link to TMDL tracker.]

# Example maps

Figure 1. Sampling map of Wildcat Lake. Sections 3,6,9 and 12 were sampled for the Lake Vegetation Index. The water quality sample was collected from the lake center.

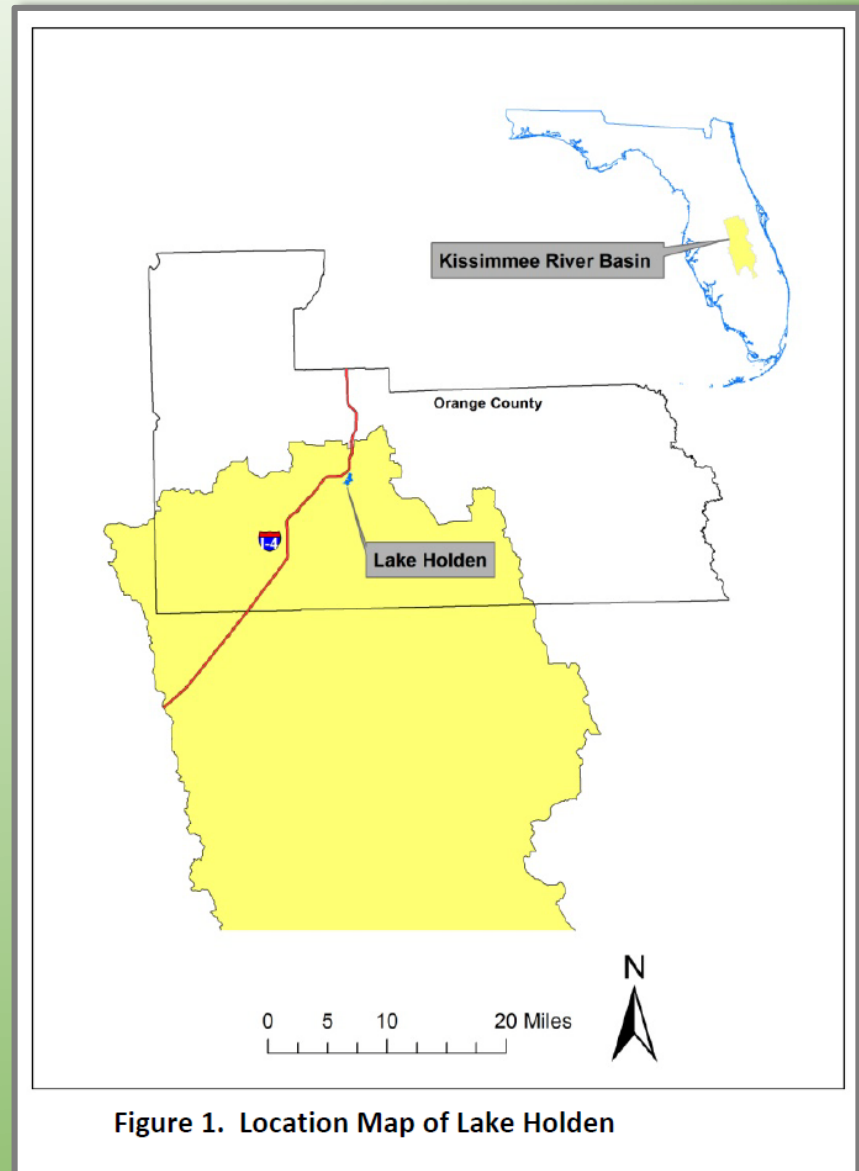
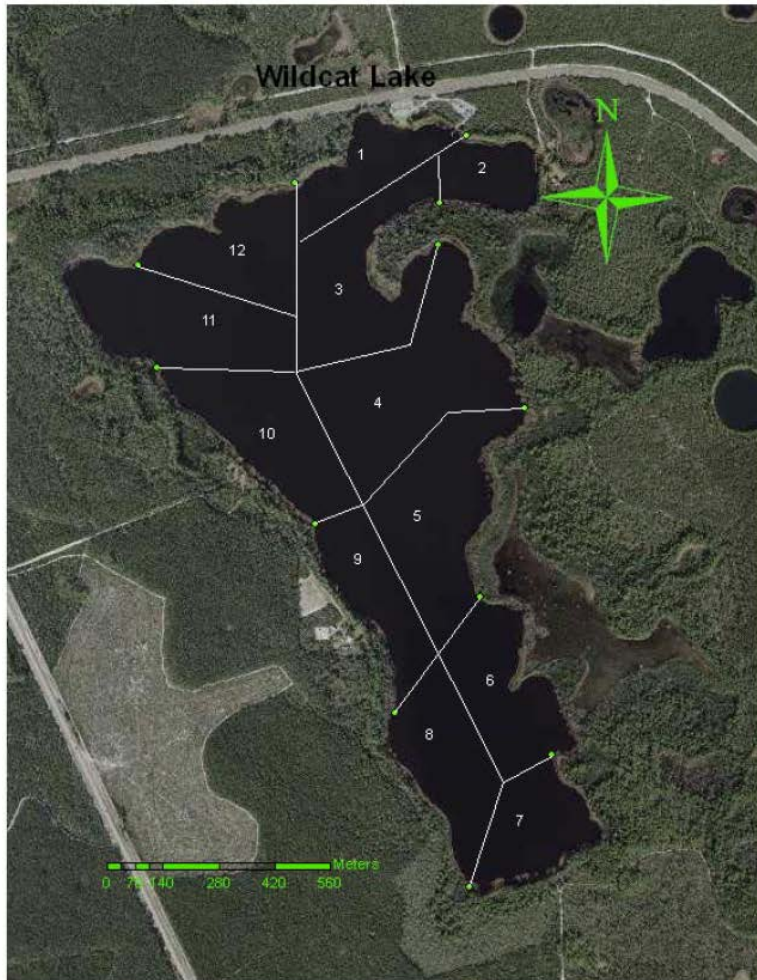


Figure 1. Location Map of Lake Holden

# Example photos



**Figure 1.** Hampton Lake



**Figure 1.** Lake Nona on April 25, 2013.

# 3. Methods

## Water Quality

- ✓ Include list of parameters (e.g. nutrients, turbidity, color, metals, microbiology)
- ✓ Include depths at which samples collected; where samples collected
- ✓ Specify if Class other than III
- ✓ Template language includes explanation of lake NNC and table of NNC criteria based on lake color and alkalinity

## Dissolved Oxygen

- ✓ Note DO region (same as SCI bioregion)
- ✓ Include optional template language if sampling for natural background DO study

## LVI

- ✓ Template includes how LVI works
- ✓ Include LVI sampling map and which sections were sampled

## Phytoplankton

- ✓ Note if phytoplankton sample collected
- ✓ Note if algal bloom sample collected

# 4. Results

## ✓ Water Quality

- ✓ Results go in table (would typically want to events) →
- ✓ Highlight or note exceedances, and describe, to the extent possible, whether due to natural conditions or human disturbance
- ✓ Make sure DO exceedances are based on time of day adjustments
- ✓ Use data qualifier codes where applicable and define below table

## ✓ NNC Thresholds

- ✓ Indicate whether thresholds were met for these sampling events, for the correct color and alkalinity category, with acknowledgement that compliance is based on AGMs (min 4 samples, 1 in 3 exceedance)

**Table 1. Water quality results from surface water samples collected on August 1, 2012 at Wildcat Lake by FDEP. Water quality criteria from 62-302, F.A.C.**

| Analyte                               | 6/4/12 Result | Comment | Applicable Class III Water Quality Criteria        |
|---------------------------------------|---------------|---------|----------------------------------------------------|
| Field Temperature (°C)                | 32            |         |                                                    |
| Field pH (SU)                         | 6.2           |         |                                                    |
| Field Dissolved Oxygen (mg/L)         | 6.74          |         | ≥ 5                                                |
| Field Specific Conductance (µmhos/cm) | 48            |         | "Not to exceed 50% of background or 1275 µmhos/cm" |
| Alkalinity (mg CaCO <sub>3</sub> /L)  | 0.65          | U       |                                                    |
| Color (PCU)                           | 8.0           |         |                                                    |
| Turbidity (NTU)                       | 2.2           |         |                                                    |
| Chlorophyll <i>a</i> (µg/L)           | 2.7           |         | <6.0**                                             |
| Total Phosphorus (mg/L)               | 0.007         |         | < 0.03**                                           |
| Total Nitrogen (mg/L)                 | 0.29          |         | <.93                                               |
| Nitrate+Nitrite (mg/L)                | 0.004         | U       |                                                    |
| Ammonia (mg/L)                        | 0.011         | I       |                                                    |
| Total Kjeldahl Nitrogen (mg/L)        | 0.29          |         |                                                    |
| Secchi disk depth (m)                 | 3.3           |         |                                                    |

\*\*proposed 62-302 thresholds for Annual Geometric Mean Total

U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

# 4. Results, continued

## ✓ Phytoplankton

- ✓ If phytoplankton are collected, provide percentages of various groups (cyanobacteria, green algae, diatoms, etc;)
- ✓ If an algal bloom sample is collected, present results and discuss (consult with Biology Lab)

## ✓ LVI

- ✓ Include:
  - Score
  - Condition category
  - Number of FLEPPC taxa
- ✓ Include plant taxa list
  - ✓ common name table generator  
<http://www.dep.state.fl.us/water/bioassess/plantid.htm>
- ✓ Include discussion and photos, and any planned follow up if lake is below healthy threshold

# 5. Conclusions

✓ Choose a conclusion category and expand on the provided language in the template:

1. **Meeting Designated Use**—the Lake Vegetation Index indicates plant communities that are consistent with expectations for a healthy well-balanced lake; water quality results on the sampling dates were within acceptable limits for chlorophyll a, total nitrogen, and total phosphorus
2. **Not Meeting Designated Use**—e.g. High nutrient levels were associated with imbalances in the lake's floral community – high chlorophyll and failing LVI score(s) indicate phytoplankton has become the dominant primary producer instead of expected native macrophytes.
3. **Inconclusive**—e.g. LVI indicates that the plant community is not consistent with that of a healthy lake, but nutrient and chlorophyll results indicate they are within acceptable ranges. Follow-up sampling and/or stressor identification recommended

# Links to full text of templates

[Lake Ecosummary Full Text](#)

[Stream Ecosummary Full Text](#)