1) **Survey Timing:**
Seagrass surveys should be conducted during the main growing season in most locations in the state. This provides the agencies with the best information (maximum aerial extent of seagrass, peak above ground biomass and greatest diversity of species) for permitting decisions. Seagrass surveys conducted outside the main seagrass growing season are inadequate to address the avoidance of seagrass habitat by project construction, or to determine the amount of seagrass resources affected, which is needed to correctly determine the required mitigation.

Seagrass surveys must be conducted between the dates of *April 1st and October 31st* with the following exceptions:

- **a)** Seagrass surveys may be conducted *year-round* in southern Dade County (Virginia Keysouth) and Monroe County where seagrass growth is not significantly different during the winter as they are in most other areas of the state.

- **b)** Florida East Coast between Indian River County (Sebastian Inlet) and Dade County (Virginia Key) seagrass surveys should be conducted between the dates of *April 1st and August 31st* to accommodate the Johnson’s Seagrass growing season and period of maximum abundance pursuant to the Johnson’s Seagrass (*Halophila johnsonii*) Recovery Plan (JSRP)*.

*Note that the optimal growing season for Johnson’s seagrass is considered June through September (NOAA NMFS, 2010). If surveys are not performed during the optimal growing season, additional surveys may be needed depending upon the site and circumstances to accommodate federal permitting requirements. Please refer to the [NOAA website](https://www.noaa.gov) for guidance on federal seagrass survey protocols.*

2) **Seagrass survey products:**
The following information is needed to assess the seagrass resources at the project site, what resources will be impacted directly or indirectly by the project and if necessary.

- **a)** A map showing seagrass distributions by species within the project boundaries.
- **b)** A site map showing the footprint of the construction project in relation to all seagrass resources.
- **c)** A map indicating the location of the seagrass transects or sampling locations.
- **d)** The percent coverage of seagrass or seagrass shoot density for each species present.
- **e)** Total amount (acres or square feet) of seagrass habitat impacted as a result of the proposed construction.
3) **Seagrass Survey Data Collection Techniques:**
Seagrasses, especially the diminutive species, can be difficult to see or identify in turbid water conditions, at depth or accurately distinguishing seagrass bed edges can be difficult to determine, as can be determining algae from seagrass without conducting an in-water survey. Because of this, seagrass surveys conducted with observations made from a boat will not be accepted and aerial survey data will not be accepted as a sole survey methodology.

a) **Potential Survey Methods:**
- i) Visual (in-water) reconnaissance (should be a prerequisite for all sites).
- ii) Regularly spaced transects (if seagrass is located within the project boundaries)
- iii) Diver-towed transects
- iv) Video Transects (either mounted on a sled or towed by a boat)
- v) Aerial Surveys (considered supporting information and will not substitute for visual surveys)

b) **Unacceptable Methodology:**
- i) Out of water seagrass surveys conducted by boat
- ii) Ponar or Eckman grabs – (destructive sampling is not condoned and these techniques do not survey a broad enough area to be adequate).
- iii) Sonar – currently this technique has not proven to be able to detect all seagrass species and densities. In addition, water depths and water quality conditions also affect the reliability of the information collected by this method.
- iv) Other hydroacoustic and hyperspectral imaging techniques are also not proven to adequately detect seagrass at the necessary resolution for permitting survey needs.

c) **Seagrass Data:**
- i) Seagrass species identification and location.
- ii) Identify the locations of the nearshore bed edge and seaward bed edge within the project site.
- iii) Delineation of patch distribution if seagrass distribution is not continuous within the project site.
- iv) Quantification of seagrass resources – Any of the following techniques would be acceptable to describe the seagrass resources within the project area:
  - v) Areal % Cover by species and totaled for all species present (meter square quadrate assessment method along transect lines)
  - vi) Species Density (Braun Blanquet method)
  - vii) Shoot Density (random or systematic shoot counts within quadrates distributed within the project area).
- viii) A minimum of 10% of the transect length should be quantitatively assess (10 meter squares/100 meter long transect).

**Seagrass Habitat Definition:**

“Seagrass habitat is defined in this document as a physical space containing seagrasses in sufficient quantity and pattern to produce the appropriate structural and physiological characteristics to support organism typical of seagrass communities. These characteristics include food webs based on organic-matter production, nutrient cycling, detritus production, shelter, and sediment formation” (Dawes C.J, R.C. Phillips, G. Morrison, 2004).
Seagrass Species included:
- *Ruppia maritima*  
  Widgeon Grass
- *Syringodium filiforme*  
  Manatee Grass
- *Thalassia testudinum*  
  Turtle Grass
- *Halodule wrightii*  
  Shoal Grass
- *Halophila decipiens*  
  Paddle Grass
- *Halophila engelmannii*  
  Star Grass
- *Halophila johnsonii*  
  Johnson’s Seagrass (T)

SCHEME (modified) Distribution criteria:
1) Submersed Aquatic Vegetation (SAV)
   1) Any combination of SAV (i.e. seagrasses, oligohaline grasses, attached macroalgae and drift macroalgae) that covers a substrate.
   2) Submersed Rooted Vascular Plants (SRV) (i.e. seagrasses and oligohaline grasses)
      a) Habitat with cover of SRV.
   3) Continuous SRV
      a) This includes continuous beds of any shoot density (i.e. sparse continuous, dense continuous or any combination). These areas appear as continuous seagrass signatures; however, small (less than 0.5 acres) bare sediment areas may be observed as infrequent features within the area.
      b) Dense patches of SRV in a matrix of continuous, sparse SRV
         1. Continuous coverage of sparse SRV in which dense patches of SRV are clearly observed interspersed within the area. This pattern is often the result of effects from the sediment or underlying bedrock characteristics.
   4) Discontinuous SRV
      a) Areas of SRV with breaks in coverage that result in isolated patches of SRV, usually in unconsolidated bottom, but also exist in hard bottom areas. If the hardbottom is more abundant than the SRV the polygon should be recorded as Reef/Hardbottom Class and SRV can be noted with Modifiers. Generally, these grass features appear as semi-round patches or elongated strands separated by bare sediment.

Macroalgae Habitat Definition:

Rocky shores and solid substrates down to the lower limit of the photic zone provide the main habitat for macroalgae, however, soft sediments and sands can also provide habitat for temperate to tropical estuarine and marine algae that use holdfast networks to anchor them below such sediments. The biotic and abiotic characteristics of macroalgae habitat are similar in definition to those of seagrass above.

Macroalgae species included (but not limited to):
- *Argardhiella* spp.
- *Dictyota* spp.
- *Avrainvellea* spp.
- *Digenia* spp.
- *Batophora* spp.
- *Gracilaria* spp.
Bryopsis spp.   Halimeda spp.
Calothrix spp.   Laurencia spp.
Caulerpa spp.   Oscillatoria spp.
Chondria spp.   Penicillus spp.
Cladophora spp.   Rhipocephalus spp.
Sargassum spp.

2) SCHEME Distribution criteria:
a) Macroalgae
   i) Attached Macroalgae
      Habitat with 10 percent or more cover of mixed or monospecific macroalgae attached to the substrate with holdfasts, rhizomes, or other morphological feature.
   ii) Continuous attached macroalgae
      (a) This includes continuous beds of any density (i.e. sparse continuous, dense continuous or any combination). These areas appear as continuous attached macroalgae or SRV signatures. Often macroalgae can’t be interpreted from the imagery without field verification to detect the difference from SRV. Small (less than 0.5 acres) bare sediment areas may be observed as infrequent features within the area.
      (b) Dense patches of attached macroalgae in a matrix of continuous, sparse macroalgae
         1. Continuous coverage of sparse attached macroalgae in which dense patches of attached macroalgae are clearly observed interspersed within the area. This pattern is often the result of effects from the sediment or underlying bedrock characteristics.
   iii) Discontinuous attached macroalgae
      (a) Areas of attached macroalgae with breaks in coverage that result in isolated patches, usually in unconsolidated bottom but also exist in hard bottom areas.

References:


