Submerged Aquatic Vegetation Assessment

Gulf State Park
Shelby Lake
87° 39' 28.867" West / 30° 15' 23.501" North
Gulf Shores, Alabama
Volkert Contract No. 334001.12

Prepared for:

Alabama Department of Conservation and Natural Resources
64 North Union Street
Suite 479
Montgomery, Alabama 36130

August 29, 2013

Prepared by:

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316 South McKenzie Street
Foley, Alabama 36535
(251) 968-7551

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APPENDICES

1.0 PURPOSE

The purpose of this report is to provide clear documentation of the status of submerged aquatic vegetation (SAV) for the purpose of site planning and permitting of fishing piers and elevated walkways within the Gulf State Park by the Alabama Department of Conservation and Natural Resources (ADCNR), Montgomery, Alabama. On August 22, 2013 a SAV survey was conducted at several locations along the eastern and southern shores of Shelby Lake within the Gulf State Park in Gulf Shores, Alabama (**Figure 1**). There were five different locations that were surveyed (**Figure 2**). The approximate center coordinates of the survey areas are:

Site 1, 87° 39' 14.873" West and 30° 15' 52.501" North
Site 2, 87° 39' 15.872" West and 30° 15' 47.081" North
Site 3, 87° 39' 25.165" West and 30° 15' 23.234" North
Site 4, 87° 39' 34.785" West and 30° 15' 11.607" North
Site 5, 87° 40' 07.039" West and 30° 15' 17.348" North

According to the National Marine Fisheries Service this survey occurred within their preferred timing for a SAV survey. SAV was found within several but not all of the survey areas. According to the proposed site plans, the proposed structures will consist of three pile supported fishing piers at locations 1, 2, and 3 and two additional pile supported walkways at sites 4 and 5.

The study areas focused on the proposed locations of the five overwater structures. A radius of approximately 300 feet was surveyed at each of the five sites where the structures are being proposed. Approximately 150,000 square feet of water bottom was inspected at each site where water depth was shallow enough to support SAV. Generally water depth increases as you move away from the shoreline toward the center of the lake. The average depth within the survey areas was approximately 2.5 to

4 feet deep. Areas adjacent to the project area were also inspected for SAV.

Shelby Lake is a naturally occurring shallow brackish lake. It is connected to the smaller adjacent lake to the east by way of a narrow manmade canal. There are two islands within the lake basin that are located near the eastern shore. The northern island is called Alligator Island and is approximately 6.7 acres in size. The southern island is called South Island and is approximately 6.0 acres in size. The water within this lake is most frequently recharged by rain water that flows to it from the vast wetland system that surrounds the lake on three sides. To the south the lake is separated from the Gulf of Mexico by a narrow strip of low dunes and Highway 182. Periodically storm events generate a tidal surge that wash over the straight that separates this lake from the gulf. These storm surges temporarily increase salinity within the lake. Wind is primarily from the south in the spring and summer months and generally from the north during fall and winter months. As this is a closed system, there is little if any littoral drift associated with the shoreline.

The species of sea grasses endemic to this area include but are not limited to:

1) *Vallisneria americana* – Tapegrass
2) *Ruppia maritime* – Wigeongrass
3) *Halodule beaudettei* – Shoal Grass
4) *Thalassia testudinum* – Turtle Grass

Sea grass distribution is regulated by several factors such as temperature, depth, salinity, sunlight and substrate. All four of these species in Alabama are limited to high to moderate visibility and sandy to moderately sandy substrates.

2.0 METHODS

This study was performed in two phases. Phase 1 was conducted on August 21, 2013 and Phase 2 was conducted on August 22, 2013 by Mr. Brett Gaar, REPA of Volkert, Inc. and Mr. Bill Pierce also with Volkert, Inc.. Phase I involved evaluating available aerial imagery for the project site. Phase II of the study included a complete field reconnaissance of the project areas where disturbance is anticipated to occur.

Available aerial photography for the site has been flown in recent years (2001, 2006, 2009, 2010, 2012). These photographs were reviewed in the office of Volkert, Inc. located in Foley, Alabama. Large patches of SAV are often visible on aerial photographs as areas that appear darker than surrounding non-vegetated areas. However, dark spots are not always indicative of SAV presence. Other benthic features unrelated to SAV may also appear as dark spots on photographic images. Examination of the above referenced photographs did not identify significant dark areas in the survey areas.

However, due to high levels of tannins in Shelby Lake the water visibility is considered low and not conducive to identifying SAV from aerial imagery. Each survey area centered on the location of proposed disturbance and extended out in a 300 foot radius from that location (**Figure 2**).

On August 22, 2013 an on-site inspection was conducted within the study areas to determine the presence or absence of submerged aquatic vegetation. From a small boat the study areas along the southern and eastern shores of Shelby Lake were investigated with special attention given to dark areas (shadows) to determine the identity, composition and whether material was rooted to the substrate. A tape measure was used to determine the depth of visibility. Due to the naturally occurring turbidity from tannins, substrate in water depths greater than 12 inches was not visible. Although Shelby Lake is not a tidally influenced water body, this

survey was performed during neap tide (**Figure 3**). The weather conditions were partly sunny skies with an air temperature of approximately 90^0 F and wind from the northeast at approximately 3-5 mph.

3.0 RESULTS

Using transect lines and with ample sunlight and fair visibility during the survey clumps of SAV were easily identified within portions of the survey areas. A rake was used to help locate SAV in areas of low visibility or where water depths were too great. Where SAV was identified within the survey areas it was growing in a mosaic of patches. Within these identified areas SAV accounts for approximately 40% of the water bottom within mapped polygons (**Figures 2A, 2B**). Due to the dispersal of individual patches itemized mapping was not possible. Of the plant species identified, *Vallisneria americana* and *Ruppia maritime* were identified at sites 1 and 5. Only *Ruppia maritime* was identified at sites 2 and 4. There were no SAV identified at site 3. (**Table 1**).

Table 1. Species Present by Site

Site	**Plant Species**	
	Vallisneria americana	*Ruppia maritime*
1	X	X
2		X
3		
4		X
5	X	X

4.0 CONCLUSION

On August 22, 2013 a SAV survey was conducted within five separate survey areas along the eastern and southern banks of Shelby Lake within

the Gulf State Park. The purpose of the survey was to locate, identify and quantify any and all SAV in the designated survey areas. The on-site inspection was performed by boat. Using transect lines and with good visibility, clumps and patches of SAV were easily identified within portions of sites 1, 2, 4, and 5. The two species of SAV identified was *Vallisneria americana* and *Ruppia maritime*. SAV was not identified in or near site 3. Using a boat and a rake during the survey the limits of SAV were then identified within each survey area. SAV identified within the survey areas is growing in a mosaic of patches. Within these areas SAV accounts for approximately 40% of the water bottom within the mapped polygons.

APPENDIX A
FIGURES

8/23/13

Figure 1

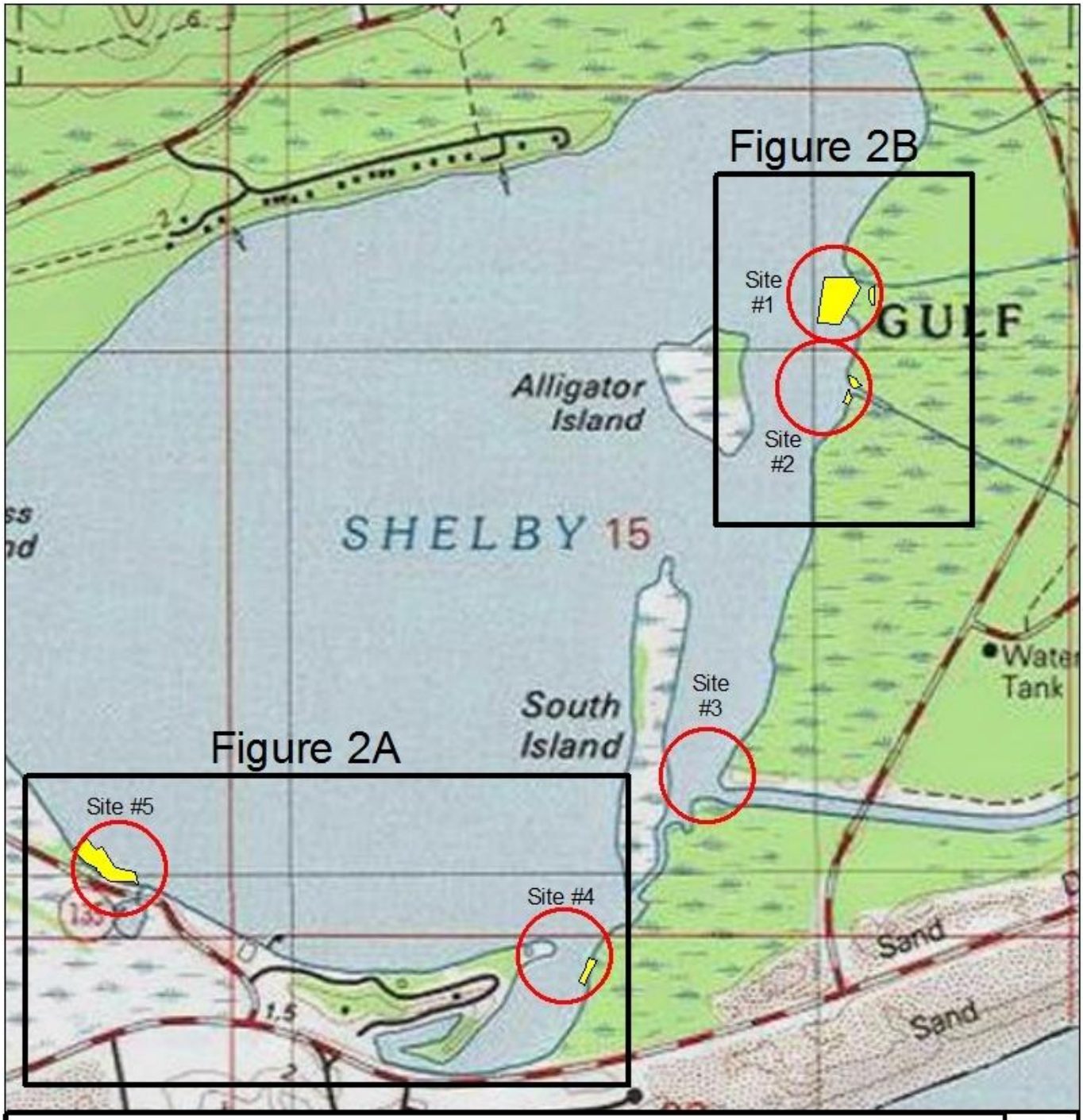
Site Location Map
Baldwin County

Legend

Survey Areas

N
W E
S

0 0.5 1 2 Miles



8/23/13

Figure 2
Submerged Aquatic Vegetation Survey
Grass Bed Location Map

Legend

- Survey Areas
- SAV

0 500 1,000 2,000 Feet

N W E S

8/23/13

Figure 2A

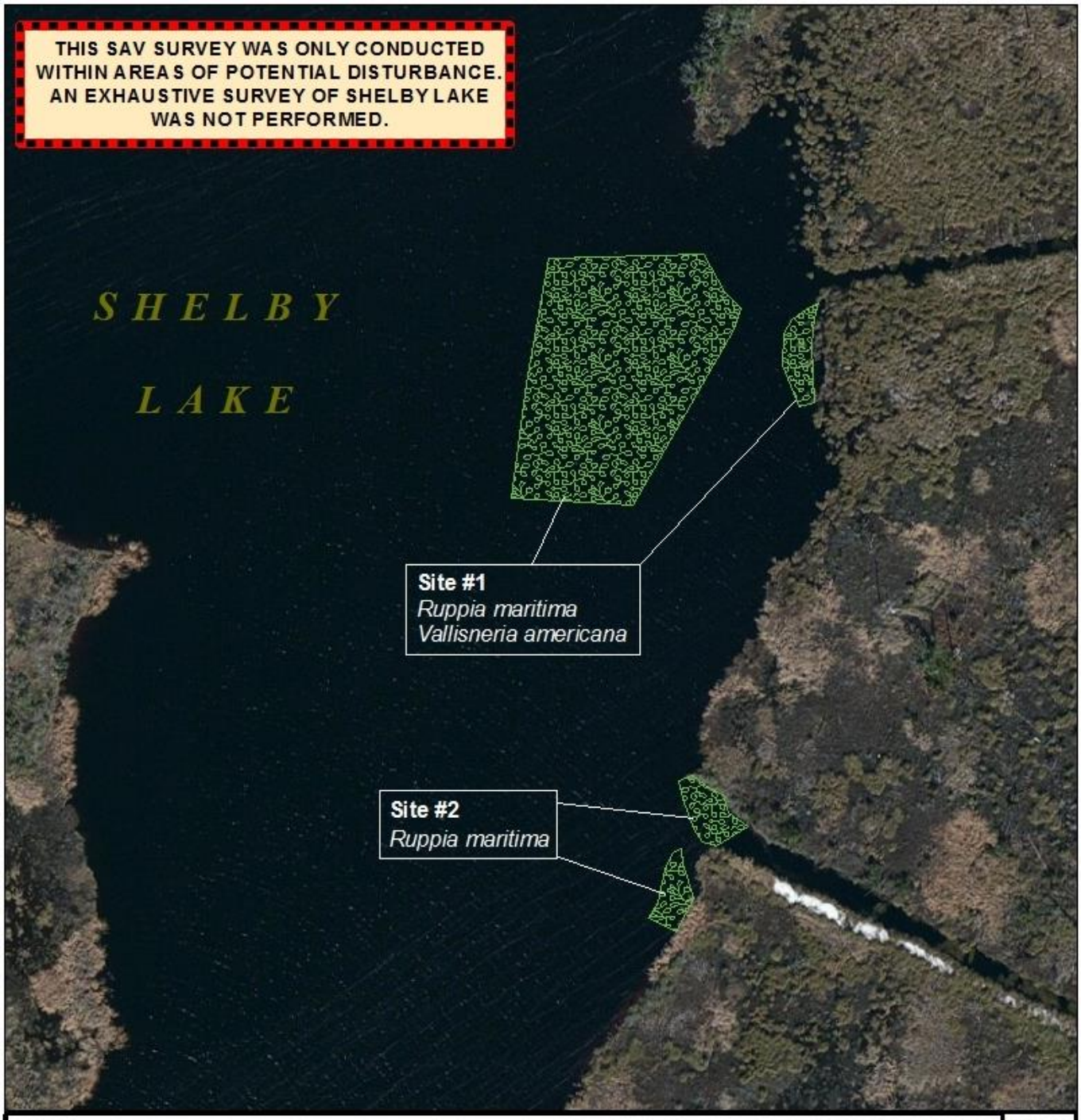
Submerged Aquatic Vegetation Survey
Grass Bed Location Map

Legend

SAV

0 500 1,000 2,000 Feet

N W E S



8/23/13

Figure 2B
Submerged Aquatic Vegetation Survey
Grass Bed Location Map

Legend

SAV

0 125 250 500 Feet

N W E S

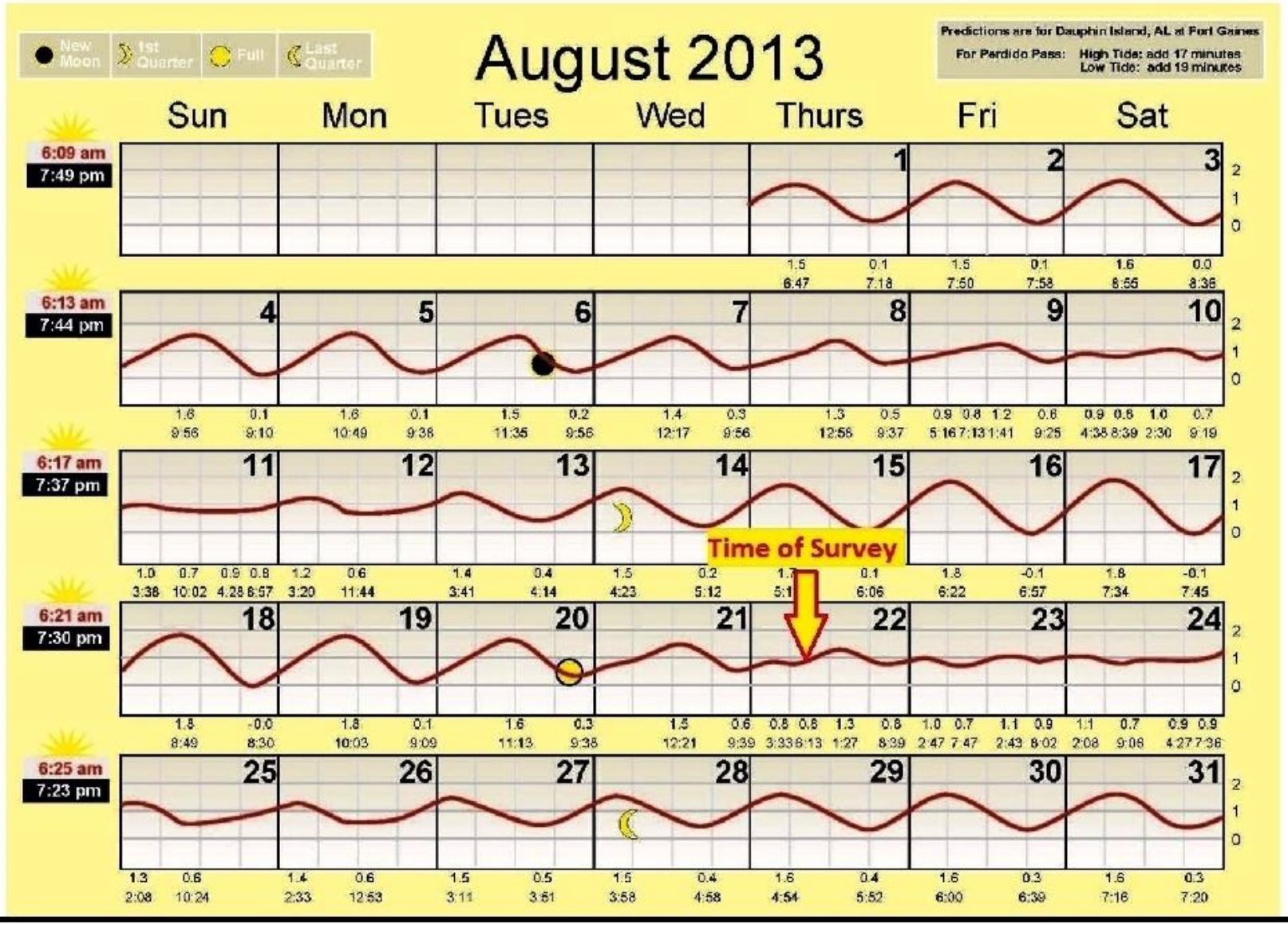


Figure 3

ADCNR Marine Resources Division 2013 Tide Calendar

APPENDIX B
PHOTOS

Photos

Photo 1: View looking east from within survey area 1.

Photo 2: *Ruppia maritime* within survey area 1.

Photos

Photo 3: View looking east from within survey area 2.

Photo 4: *Ruppia maritime* within survey area 2.

Photos

Photo 5: View looking east from within survey area 3. There was no SAV identified at this site.

Photo 6: View looking east from within survey area 4.

Photos

Photo 7: *Ruppia maritime* within survey area 4.

Photo 8: *Vallisneria americana* within survey area 5.

Photos

Photo 9: *Vallisneria americana* within survey area 5.

Photo 10: Water visibility was approximately 12 inches at the time of the survey.