Table 1. LOCATIONS: Georgia Inshore (Estuarine) Artificial Reefs

Reef Name / Original Permit Number & Year	County/Nearest Town	Southernmost Piling Latitude/Longitude	Description	Reef Type/Depth	Marked By
Halfmoon River, Year: 1987 #074 OYN 006559	Chatham/ Savannah	31.962667° 80.942617°	mouth of Halfmoon River, Wassaw Sound	Inter-tidal[2] 0-3' MLW	4 Pilings
Romerly Marsh Creek (Joe's Cut), Year: 1987, #074 OYN 006560	Chatham/ Savannah	31.931617° 80.987800°	mouth of Romerly Marsh Creek Wassaw Sound	Inter-tidal[2] 0-3' MLW	1 Piling
Ogeechee River,Year: 1998 #980001990	Chatham/ Richmond Hill	31.869550° 81.153017°	0.6 nm N of Ogeechee River marker G"1A," along Harveys Island, Ossabaw Estuary	Inter-tidal[2] 0-3' MLW	2 Pilings
Bear River, Year: 1999 #990011330	Bryan/ Sunbury	31.745333° 81.155050°	mouth of Newell Creek St. Catherines Estuary	Inter-tidal[2] 0-3' MLW	2 Pilings
Van Dyke Creek, Year: 1994 #940008210	Liberty/ Sunbury	31.685450° 81.198167°	0.58 nm NNW of ICW[3] marker G"121," at mouth of Van Dyke Creek, St. Catherines Estuary	Inter-tidal[2] 0-3' MLW	2 Pilings
Timmons River, Year: 1994 #940008170	Liberty/ Sunbury	31.677383° 81.215250°	0.87 nm W of ICW[3] marker G"121," on North side Timmons River, St. Catherines Estuary	Inter-tidal[2] 0-3' MLW	2 Pilings
Four- Mile Island, Year: 1994 #940005700	McIntosh/ Eulonia	31.536283° 81.290550°	0.30 nm NE of Four-Mile-Point Sapelo Sound	Inter-tidal[2] 0-3' MLW	2 Pilings
High Point, Year: 1999 #990011320	McIntosh/ Eulonia	31.524700° 81.242267°	West of High Point, Sapelo Island Sapelo Sound	Inter-tidal[2] 0-3' MLW	4 Pilings
Troupe Creek,Year: 1995 #950013520	Glynn/ Brunswick	31.229117° 81.440617°	0.30 nm NE of Troupe Creek Marina Troupe Creek, St. Simons Sound	Inter-tidal[2] 0-3' MLW	2 Pilings
Jove Creek, Year: 1990 #074 OYN 006977	Glynn/ Brunswick	31.216383° 81.425617°	Opposite ICW[3] marker R"238" at mouth of Jove Creek, St. Simons Sound	Inter-tidal[2] 0-3' MLW	4 Pilings
Henry Vassa Cate (Twin Sisters), Year: 1987, #074 OYN 006422	Glynn/ Brunswick	31.103383° 81.426667°	0.87 nm SW of Jekyll Island fishing pier, West of Jekyll Island, St. Simons Sound	Inter-tidal[2] 0-3' MLW	4 Pilings
Mud Creek, Year: 1998 #980002530	Camden/ St. Marys	30.904667° 81.469500°	juncture of Mud, Cumberland (ICW[3]), and Brickhill Rivers, St. Andrews Estuary	Inter-tidal[2] 0-3' MLW	2 Pilings
Stafford Island, Year: 1997 #970000900	Camden/ St. Marys	30.818917° 81.488850°	near (ICW[3]) marker G"71" Cumberland Sound	Inter-tidal[2] 0-3' MLW	2 Pilings

[1] MLW = Mean Low Water

[2] Inter-tidal Reef - Most of the structures are partially exposed during ebb-low tides.

[3] ICW = Intracoastal Waterway

[4] Sub-tidal Reef - All structures are submerged at all times.

Table 1. (Continued) LOCATIONS: Georgia Inshore (Estuarine) Artificial Reefs

Reef Name/ Original Permit Number & Year	County/Nearest Town	General Latitude/Longitude	Description	Reef Type/Depth	Marked By
Little River West Bank, Year: 1984	Glynn/	31.167550°	0.01 nm South of Little River Bridge, St.	Sub-tidal[4]	1
#074 OYN 005645	Brunswick	81.436333°	Simons Island Causeway, St. Simons Sound	8-12' MLW	Piling
Little River East Bank, Year: 1984	Glynn/	31.167700°	0.01 nm South of Little River Bridge, St.	Sub-tidal[4]	1
#074 OYN 005645	Brunswick	81.435817°	Simons Island Causeway, St. Simons Sound	8-12' MLW	Piling
Jekyll Island Pier West Arm	Glynn/	31.116696°	mouth of St Simons Sound	Sub-tidal[4]	No
Year:1984, #074 OYN 005646	Brunswick	81.418431°	St Simons Sound	5-6' MLW	Pilings
Jekyll Island Pier East Arm	Glynn/	31.117506°	mouth of St Simons Sound	Sub-tidal[4]	No
Year:2013, PGP37	Brunswick	81.417463°	St Simons Sound	5-6' MLW	Pilings

[1] MLW = Mean Low Water

[2] Inter-tidal Reef- Most of the structures are partially exposed during ebb-low tides.

[3] ICW = Intracoastal Waterway

[4] Sub-tidal Reef- All structures are submerged at all times.

APPENDIX I-Map of Georgia's 15 Inshore Artificial Reef Sites

APPENDIX II-Examples of Approved Materials and Signage Deployed

As described above, approved material types will consist of natural (shell and rock) and manmade materials (designed materials, concrete, PVC, and metal). Multiple approved material types may also be combined to create designed units and fish aggregating device (FADs) units.

Natural Materials Include but are not Limited to:

- **Shell** - Shell materials, such as clam and oyster shell, are naturally occurring in the marine environment and pose no threat to the environment or associated living resources. For example, loose oyster shells can be bagged and placed on top of wooden pallets along an inter-tidal mudflat to build an oyster reef (Figure D). These traditional materials are biodegradable and pose no threat to the environment or associated living resources.

Figure D.

- **Rock** - Rock is a naturally occurring, stable material that poses no threat to the marine environment or associated living resources. For example, surfaces of "natural" rock such as limestone and granite are irregular and rough, making them attractive to attaching organisms.

Manmade Materials Include but are not Limited to:

- **Designed Materials** - The use of designed materials are deemed compatible with the marine environment and pose no threat to living marine resources. Such designed materials will adhere to the other basic criteria of function, stability, and durability. Designed materials may consist of one approved material type or could be a combination of multiple approved material types used together. An example of a commercially constructed designed material using one approved material type are "Pallet or Reef Balls" (Figure E). Pallet balls are made by pouring concrete into a fiberglass mold containing a central Polyform buoy surrounded by various sized inflatable balls to make holes. Pallet balls units measure 3 to 5 feet in diameter. An example of designed materials consisting of a combination of approved material types used together are historical and new FAD units. The 1990's historical FAD design consisted of concrete bases and PVC pin-cushion style arms (Figure F). During 2016, GADNR modified and tested a new FAD design to enhance fish and oyster habitats. The new FAD units also consisted of a concrete base with PVC pin-cushion style arms but this structure was placed inside a metal transport tote in order to reduce subsidence (Figure G). This new design has shown to enhance oyster reef habitat while also providing structurally complex fish habitat.

APPENDIX II-Examples of Approved Materials and Signage Deployed

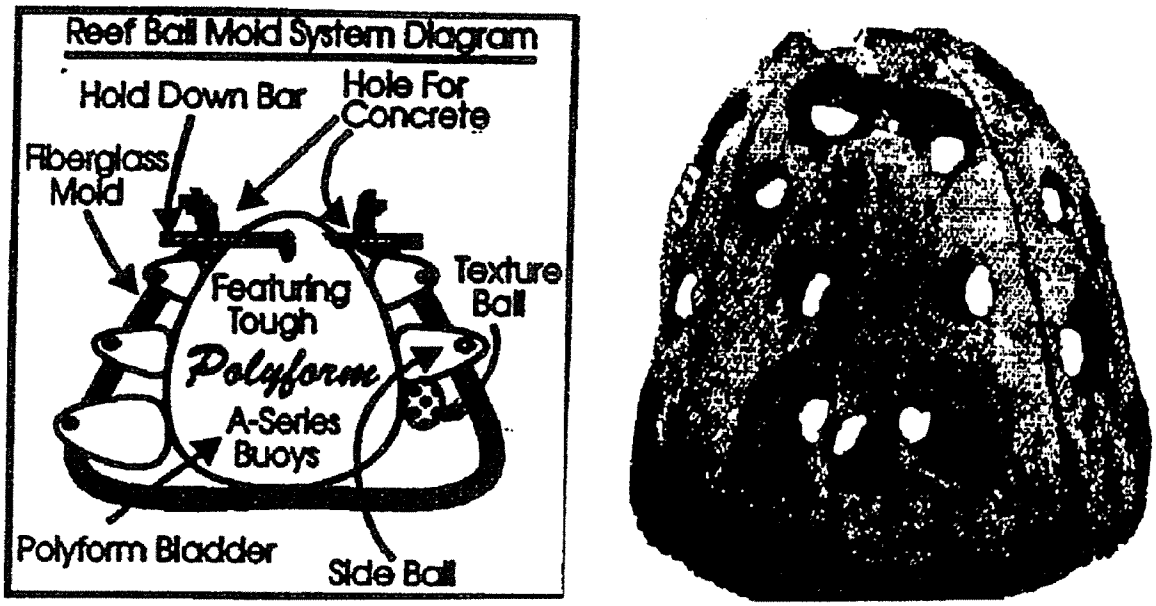


Figure E. Commercially constructed designed units, by Reef Innovations, currently exist on site and are proposed for future reef materials. "Pallet or Reef Balls" are made by pouring concrete into a fiberglass mold containing a central Polyform buoy surrounded by various sized inflatable balls to make holes. Pallet balls units measure 3 to 5 feet in diameter.

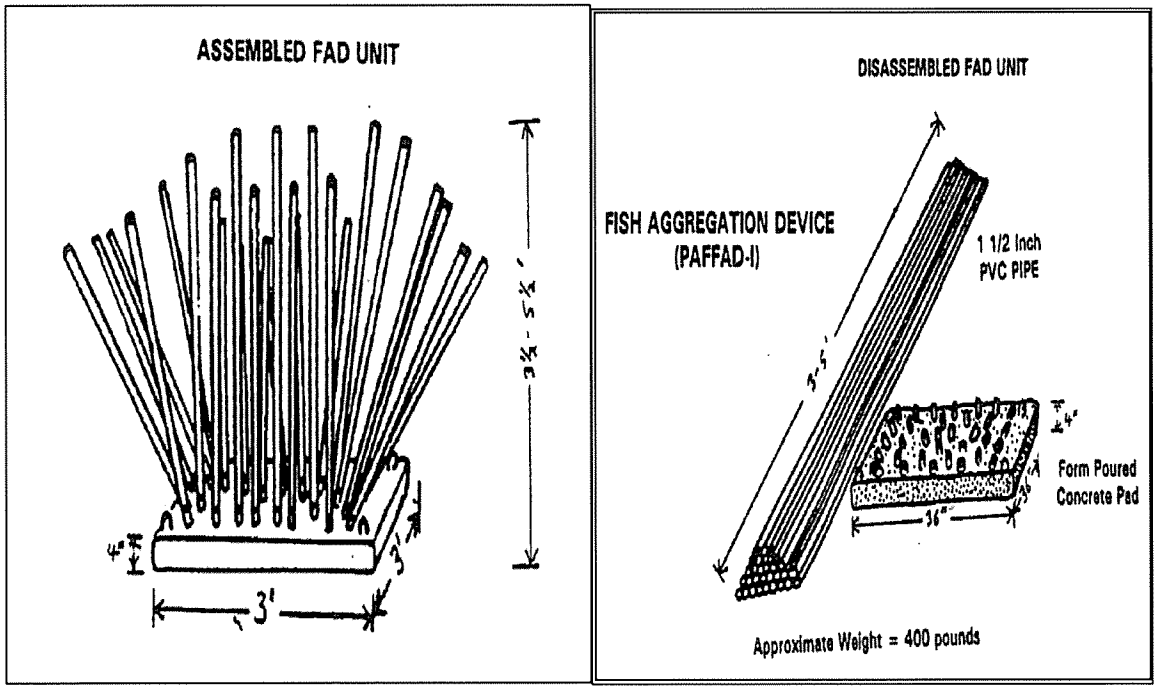


Figure F. The 1990's historical FAD units consisted of a 3-foot square, 4 inch thick concrete pad with 1 ½ inch diameter PVC protruding from the surface of pad, constructed by Department personnel. (New FAD units were created in 2016 that incorporate the concrete base and PVC arms inside a metal transport tote, shown in Figure G).

APPENDIX II-Examples of Approved Materials and Signage Deployed

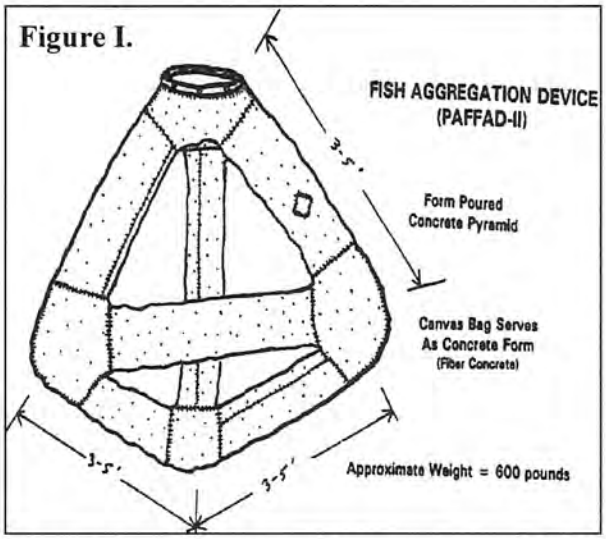

Figure F.


Figure G.

- **Concrete** - Concrete is a dense stable material that is environmentally compatible, often readily available, and can be used in designed structures. For example, Pallet Balls (Figure E), historical and new FAD units (Figures F and G), Oyster Balls (Figure H), Concrete Pyramids (Figure I), and other forms like culvert (Figure J), pilings, transmission line poles and bases, or as rubble (Figure K).

Figure H.

APPENDIX II-Examples of Approved Materials and Signage Deployed



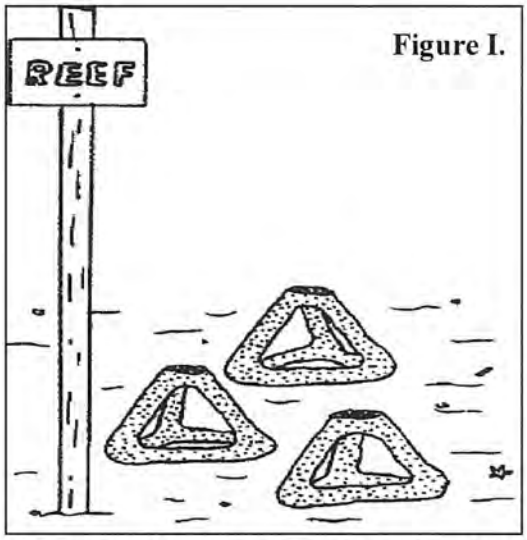
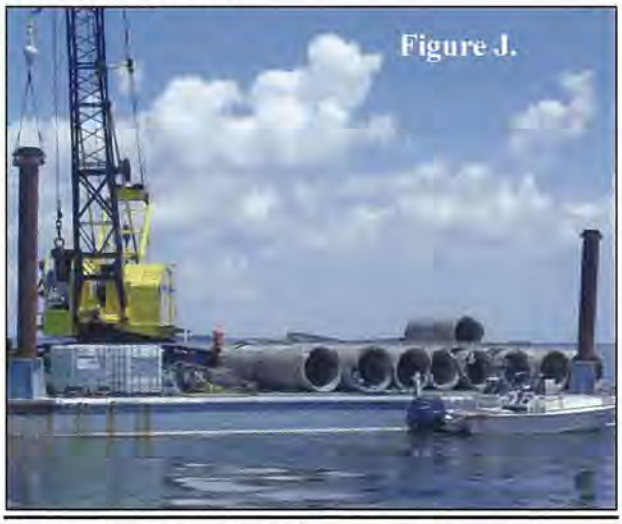
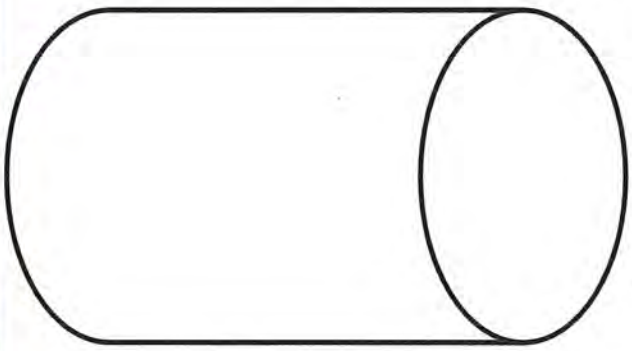


Figure I. Concrete pyramids, experimental FADs, were constructed by Department personnel and deployed at multiple reef sites throughout the Program's history. These units consist of a three to five foot high concrete pyramid constructed by pouring fiber concrete into a suspended canvas bag. Pyramid heights range from three to five feet with the diameter of pyramid legs ranging from six to eight inches. GADNR does not foresee deploying this experimental material type in the future as it no longer meets acceptable standards. Some units were damaged on site or subsided below the mudline while others remain exposed and functioning (Appendix XV, Figure 4a).

- **Culvert Materials** - Concrete (Figure J) and plastic (PVC, HDPE) culvert of various sizes and diameters. Figure J shows concrete culvert loaded on a barge for deployment and a diagram of a piece of culvert.





- **Rubble** - Rubble consists of concrete material of various sizes that has been cleaned to EPA standards and is free from rebar and toxins. For example, razed buildings, parking lots, road beds, bridges, and other sources typically contain rubble (Figure K).

APPENDIX II-Examples of Approved Materials and Signage Deployed

Figure K.

- **PVC** - Polyvinyl chloride (PVC) is a stable material and poses no threat to the marine environment or associated living resources. For example, PVC is used as a component of historical and new FAD units as these structures contain a 3" concrete slab with PVC spikes arranged vertically, pin cushion style (Figures F and G). PVC poles are also used to mark individual materials as well as deployment and/or monitoring locations. In addition, PVC spat sticks (dipped in concrete or non-dipped) placed along inshore artificial reef inter-tidal banks can promote oyster recruitment. Figure L shows an example of oyster recruitment on concrete dipped PVC spat sticks.

Figure L.

- **Metal** – Metal is a stable material that is environmentally compatible and poses no threat to the marine environment or associated living resources. Examples of metal materials are bridge supports and similar heavy metal structures, PTCs with approximate dimensions 8' L x 4' W x 4' H (Figure M), FADs, metal culverts, metal transport totes (Figure G), and other metal forms.

APPENDIX II-Examples of Approved Materials and Signage Deployed

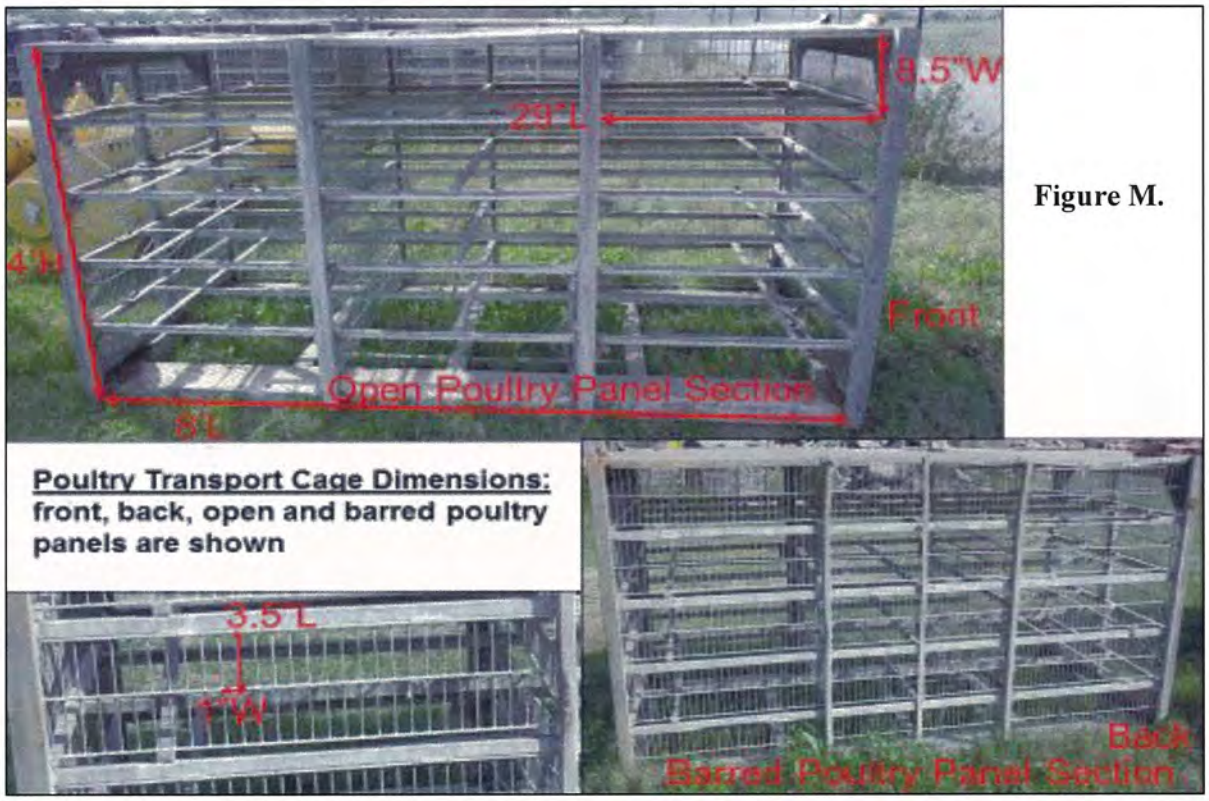


Figure M.

Signage: Submerged reef warning signs (Figure N) are constructed of 0.80 gauge aluminum. Signs measure 36" x 36" and have a 2" thick reflective orange border and a reflective white background. The words "DANGER SUBMERGED REEF" are presented in black letters.

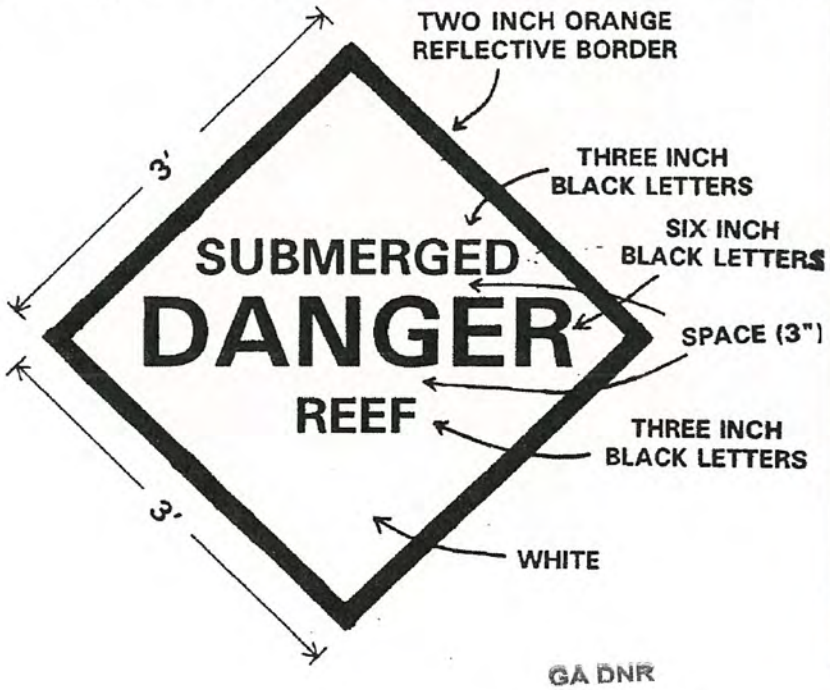


Figure N.

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APPENDIX IV-Halfmoon River Site

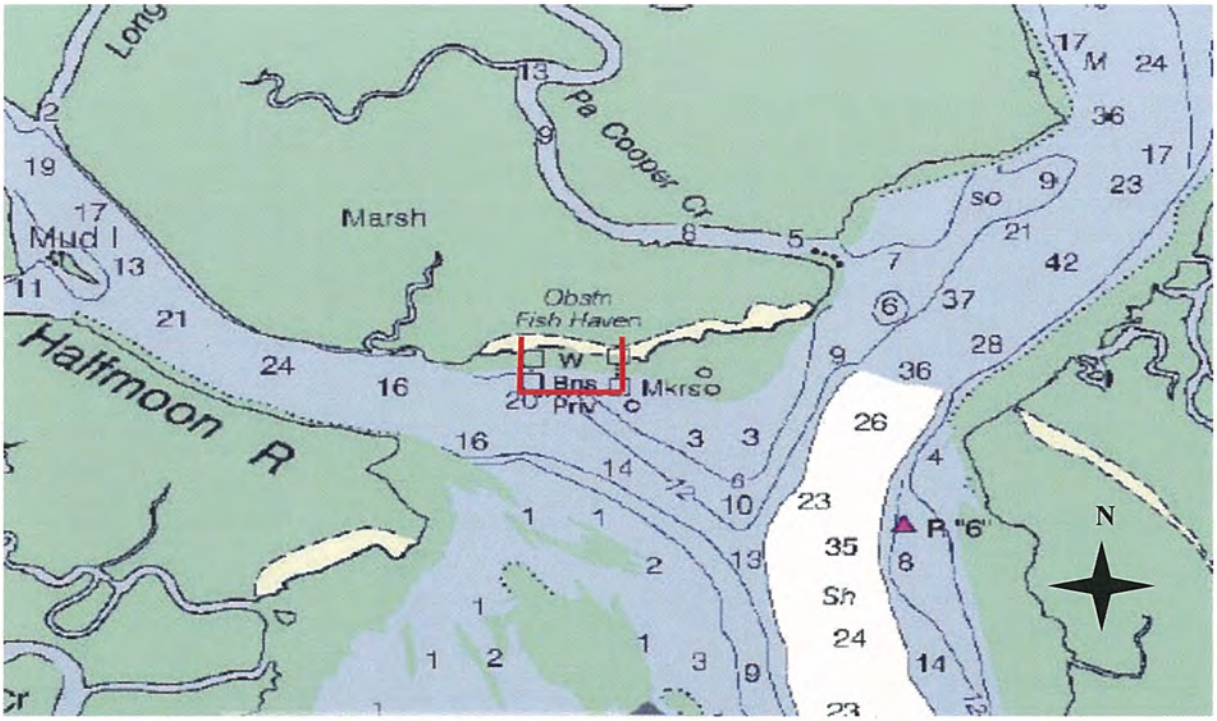


Figure 1. Halfmoon River Inshore Artificial Reef Site Shown in Red
Nautical Chart #11512 (NOAA: Savannah River and Wassaw Sound)

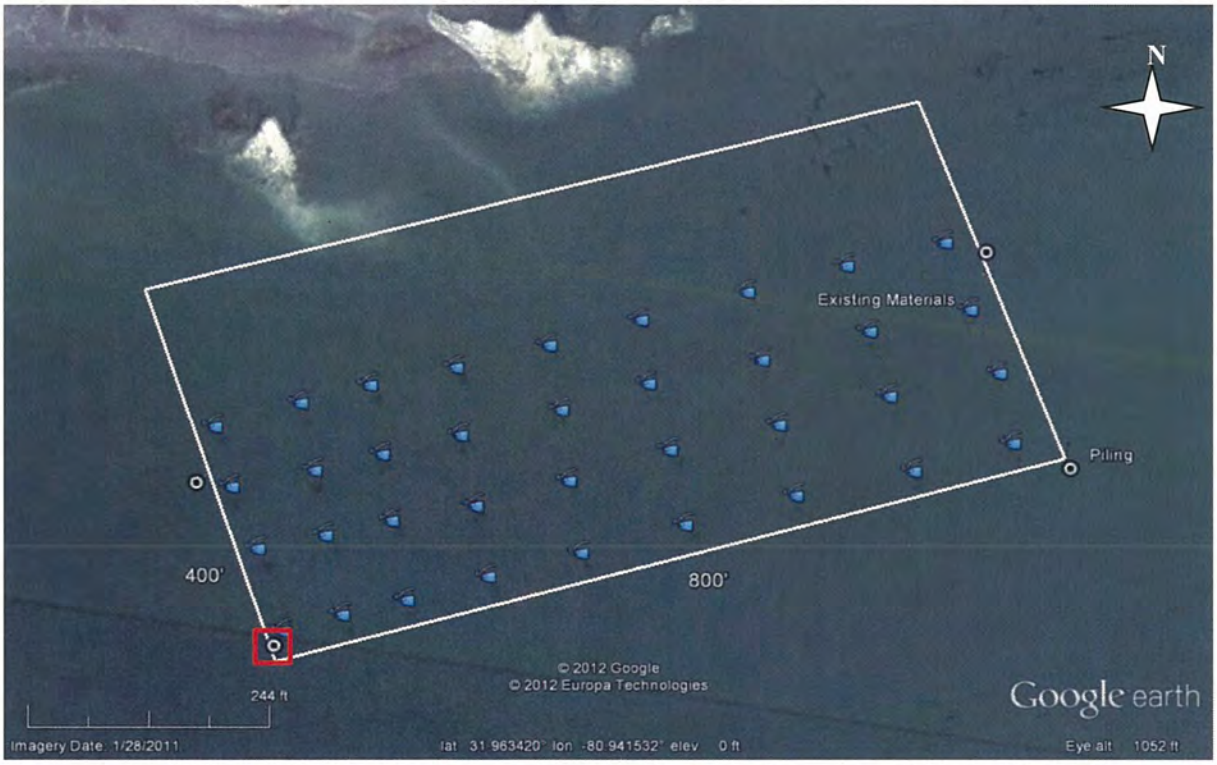


Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (800' x 400'). For navigational purposes the southernmost piling is outlined in red.

APPENDIX IV-Halfmoon River Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name:	**31.962667° / -80.942617°**	320,000 Ft^2	0.0 nm	0.0 nm	0.09 nm	0.0 nm	14 Feet	0.6 nm
Halfmoon River	31.963133° / -80.942867°	7.35 Acres						
	31.963793° / -80.940305°							
	31.963173° / -80.940032°							

Figure 3a.

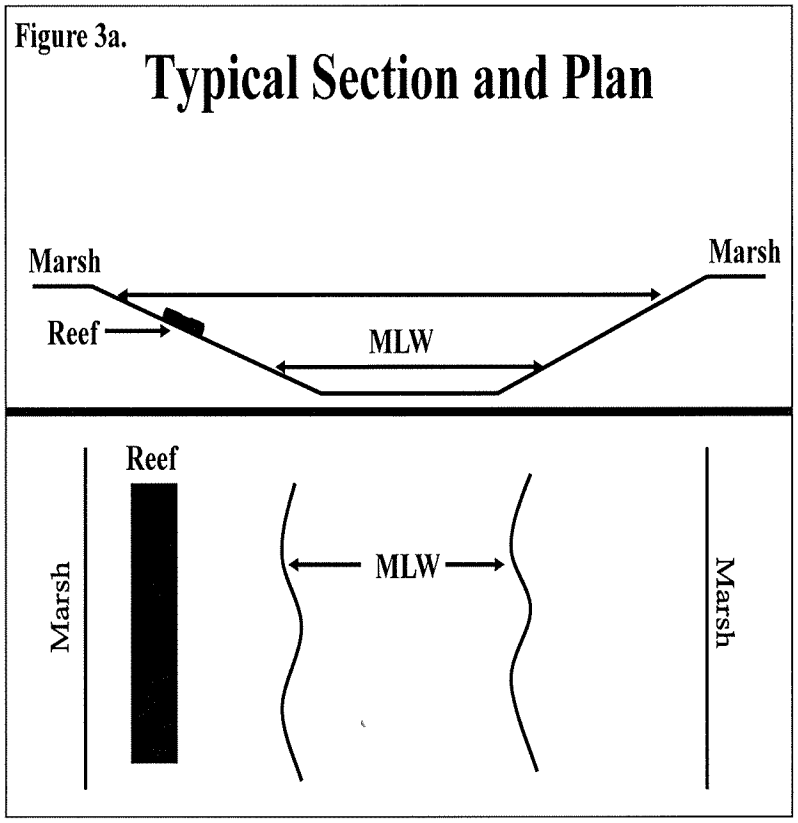
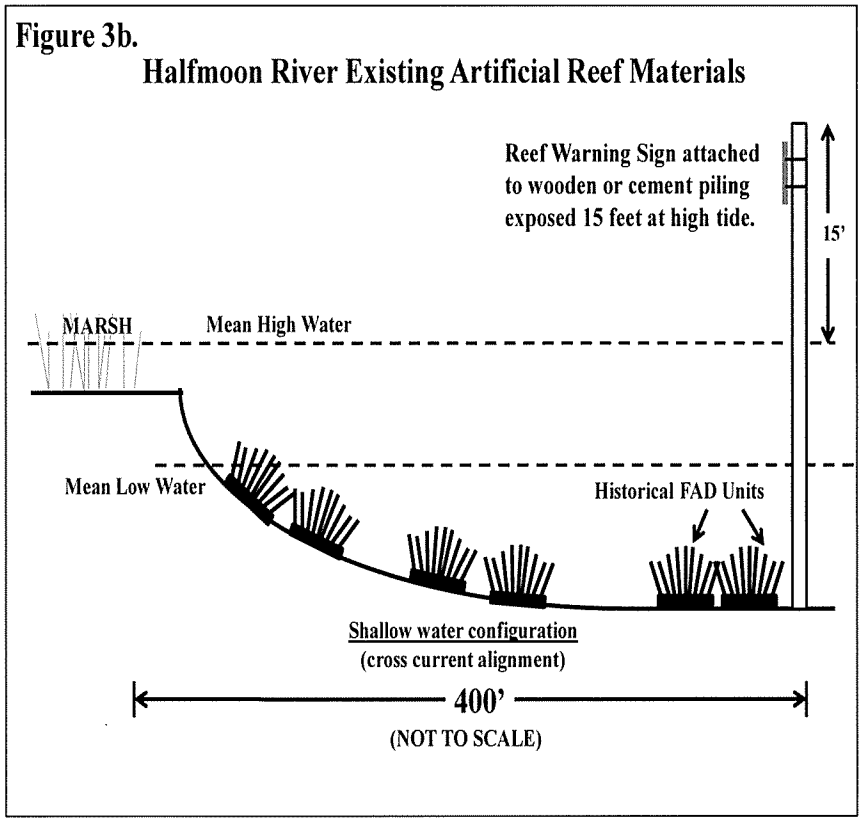


Figure 3b.



APPENDIX IV-Halfmoon River Site

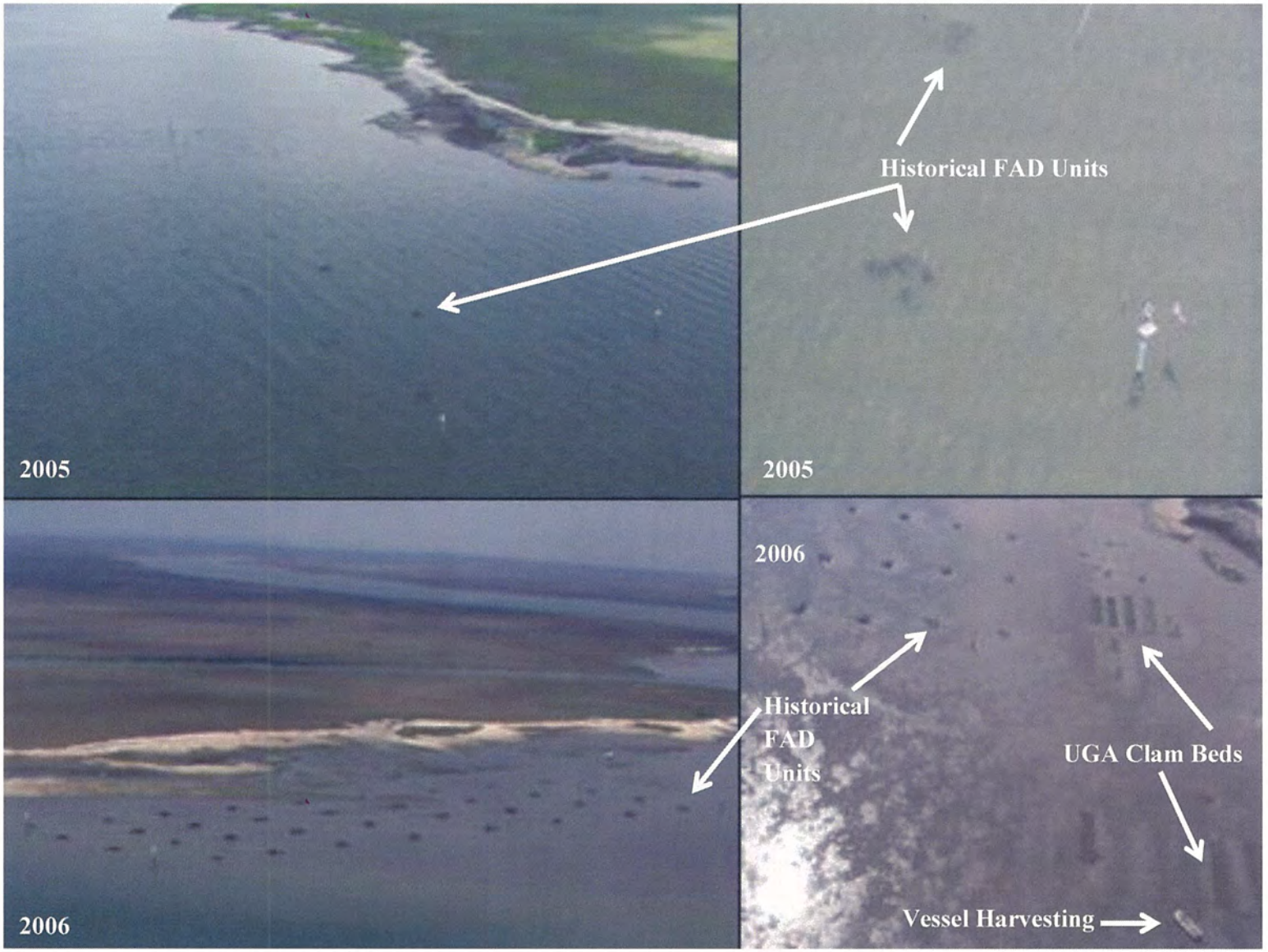


Figure 4a. Halfmoon River reference photographs from helicopter over-flights: 2005 and 2006.

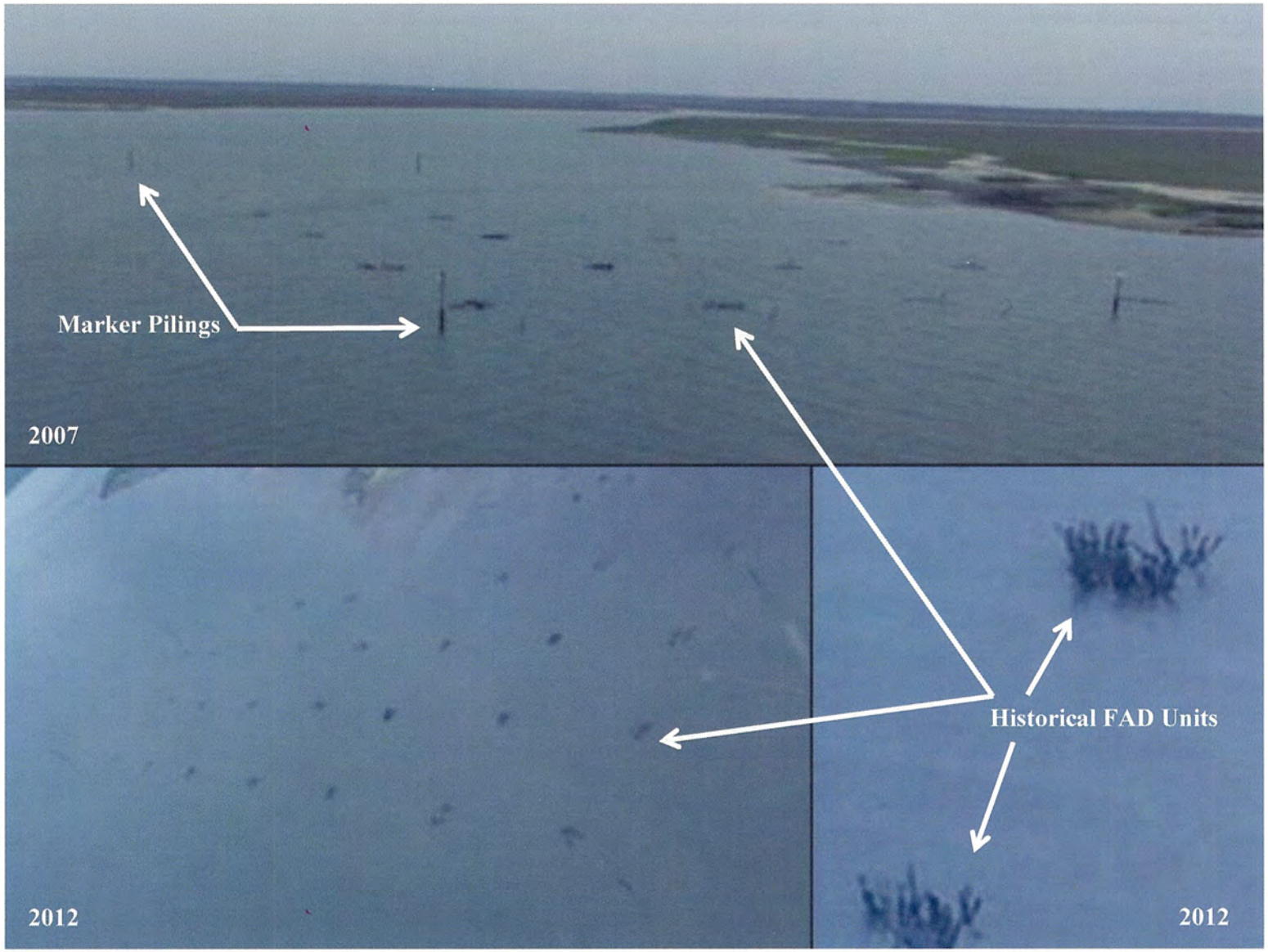


Figure 4b. Halfmoon River reference photographs from helicopter over-flights: 2007 and 2012.

APPENDIX V- Romerly Marsh Creek (Joe's Cut) Site

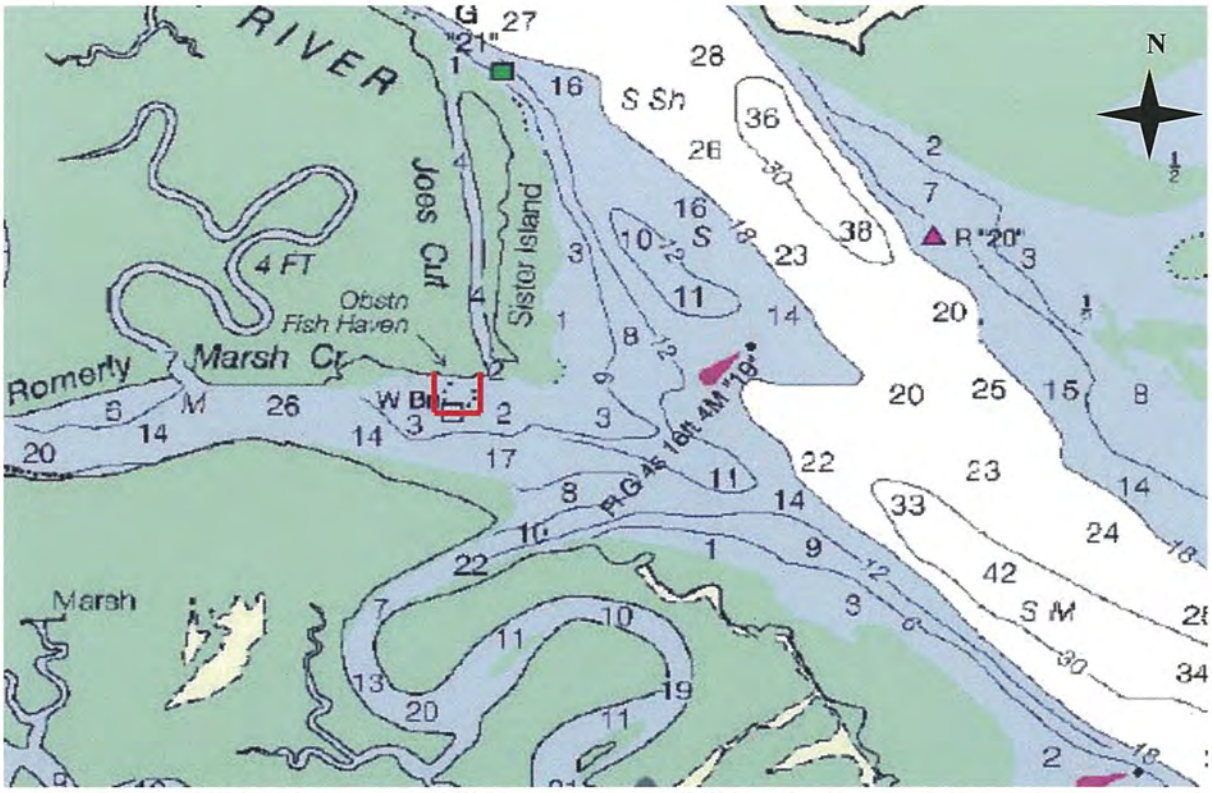


Figure 1. Romerly Marsh Creek (Joe's Cut) Inshore Artificial Reef Site Shown in Red Nautical Chart #11512 (NOAA: Savannah River and Wassaw Sound)

Figure 2. Reef Site Aerial Photograph shown with existing piling, materials, and footprint (550' x 250'). For navigational purposes the only piling is outlined in red.

APPENDIX V- Romerly Marsh Creek (Joe's Cut) Site

Table 2. Site Name:	**Single Piling Location: Latitude & Longitude used for Navigation Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Romerly Marsh Creek (Joe's Cut)	**31.9316170 °/ -80.9878000°**	137,500 Ft^2 3.16 Acres	0.0 nm	0.0 nm	0.06 nm	0.0 nm	17 Feet	0.1 nm

Figure 3a.

Typical Section and Plan

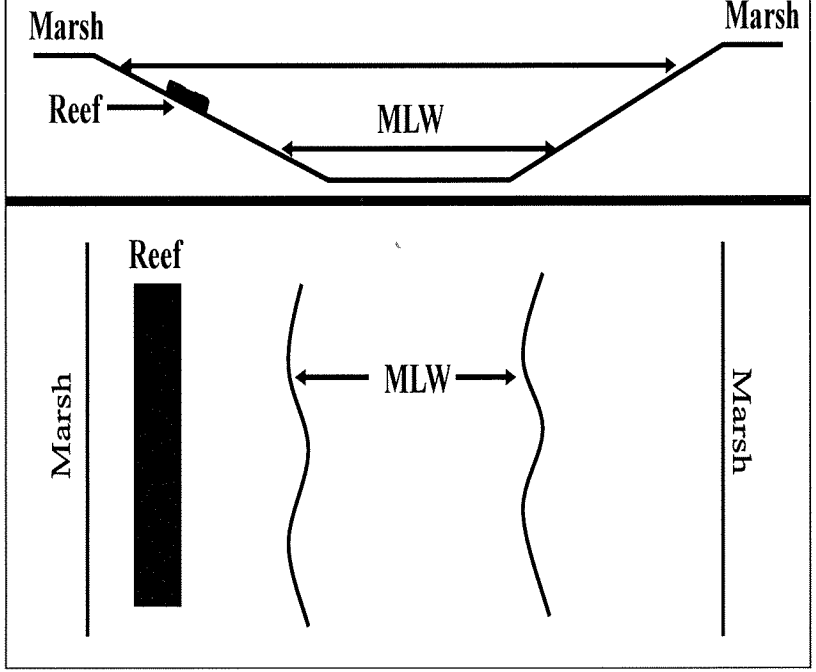
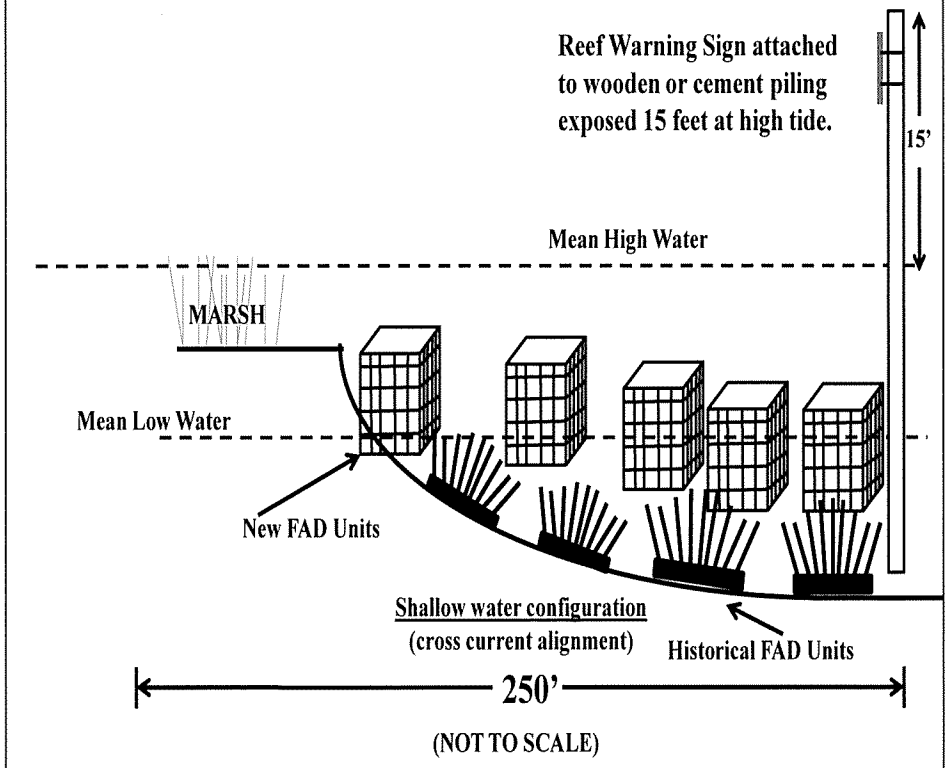


Figure 3b.

Romerly Marsh Creek Existing Artificial Reef Materials



APPENDIX V- Romerly Marsh Creek (Joe's Cut) Site

Figure 4a. Romerly Marsh Creek reference photographs from helicopter over-flights: 2005-2007.

APPENDIX V- Romerly Marsh Creek (Joe's Cut) Site

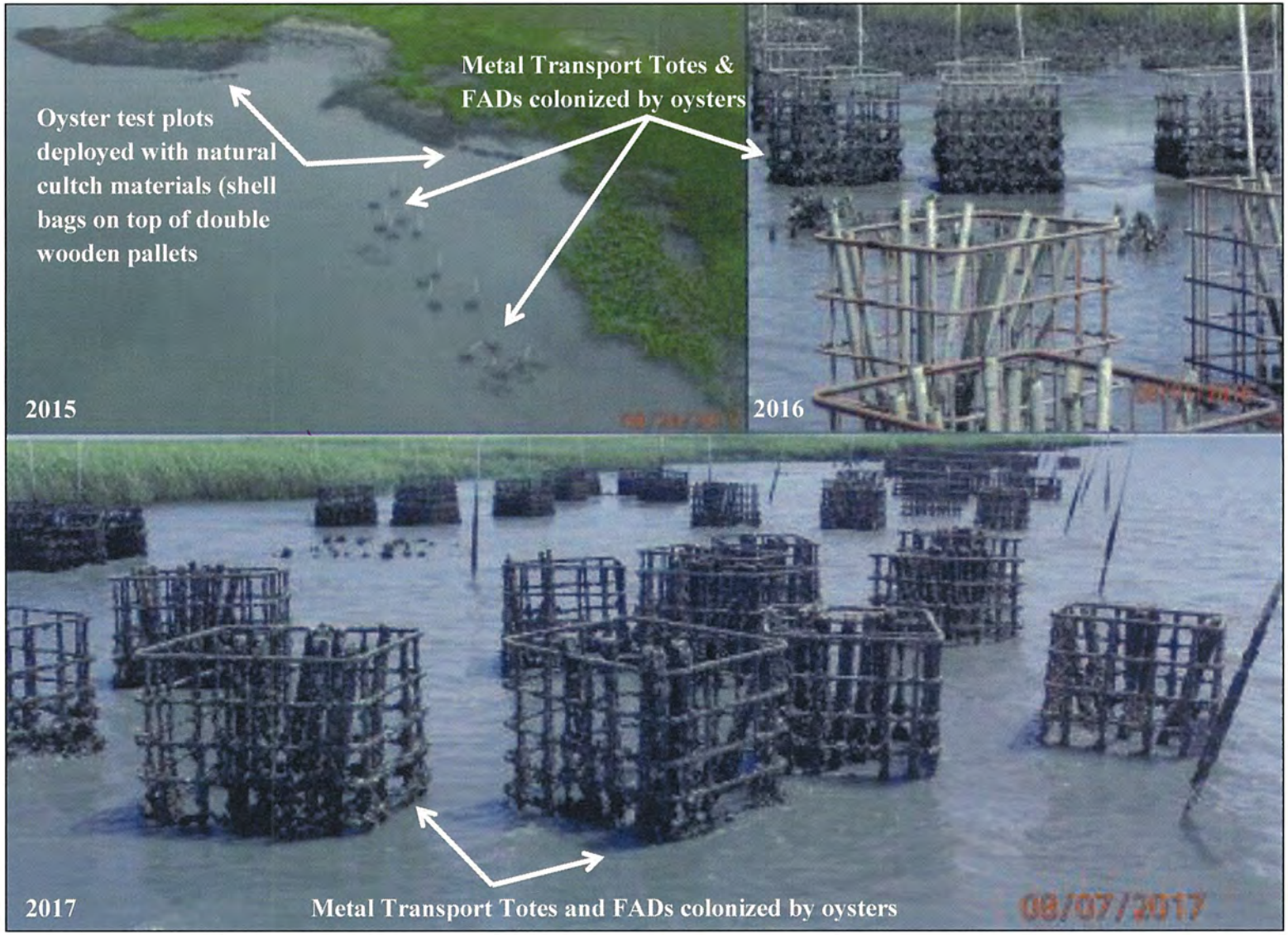


Figure 4b. Romerly Marsh Creek reference photographs from 2015 helicopter over flights and 2016-2017 monitoring surveys.

APPENDIX VI- Ogeechee River Site

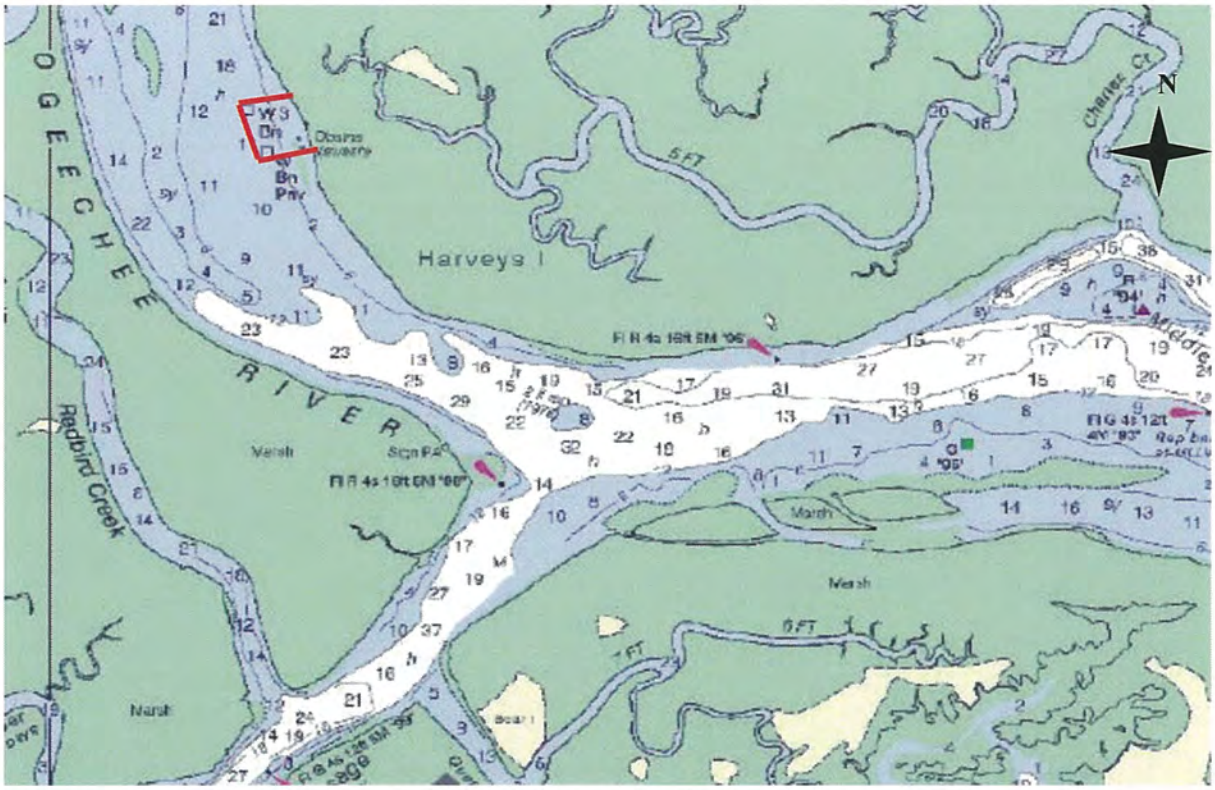


Figure 1. Ogeechee River Inshore Artificial Reef Site Shown in Red
Nautical Chart #11511 (NOAA: Ossabaw and St. Catherines Sounds)

Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (800' x 200'). For navigational purposes the southernmost piling is outlined in red.

APPENDIX VI- Ogeechee River Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name:	**31.869550° / -81.153017°**	160,000 Ft^2	0.0 nm	0.0 nm	0.26 nm	0.0 nm	12 Feet	0.5 nm
Ogeechee River	31.871633°/ -81.153710°	3.67 Acres						

Figure 3a.

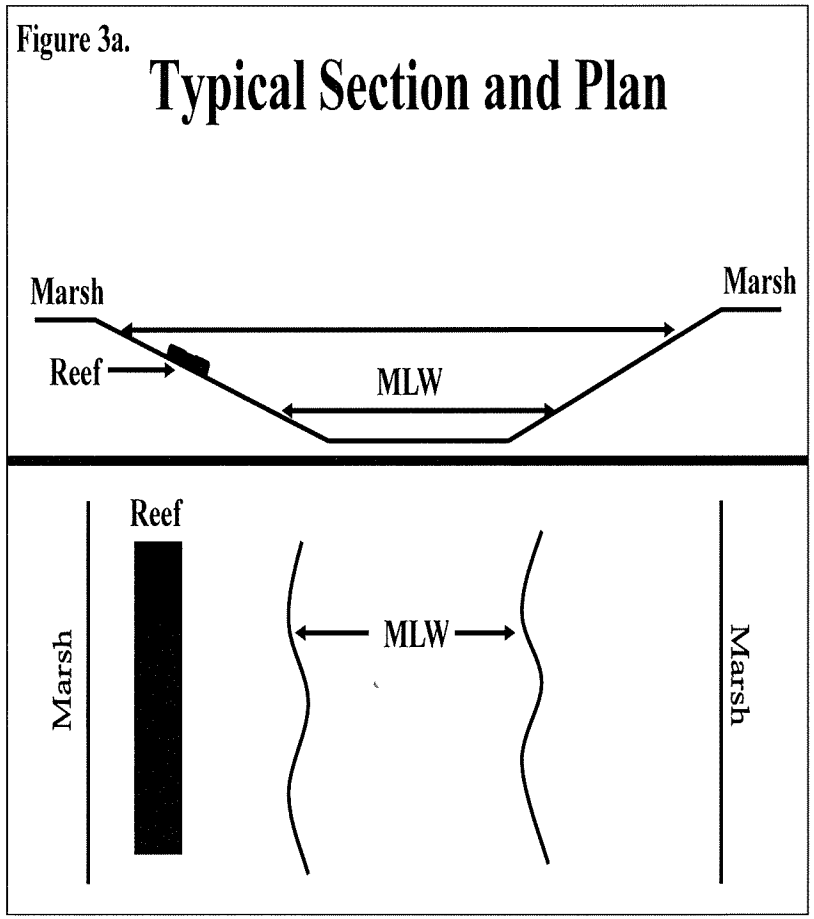
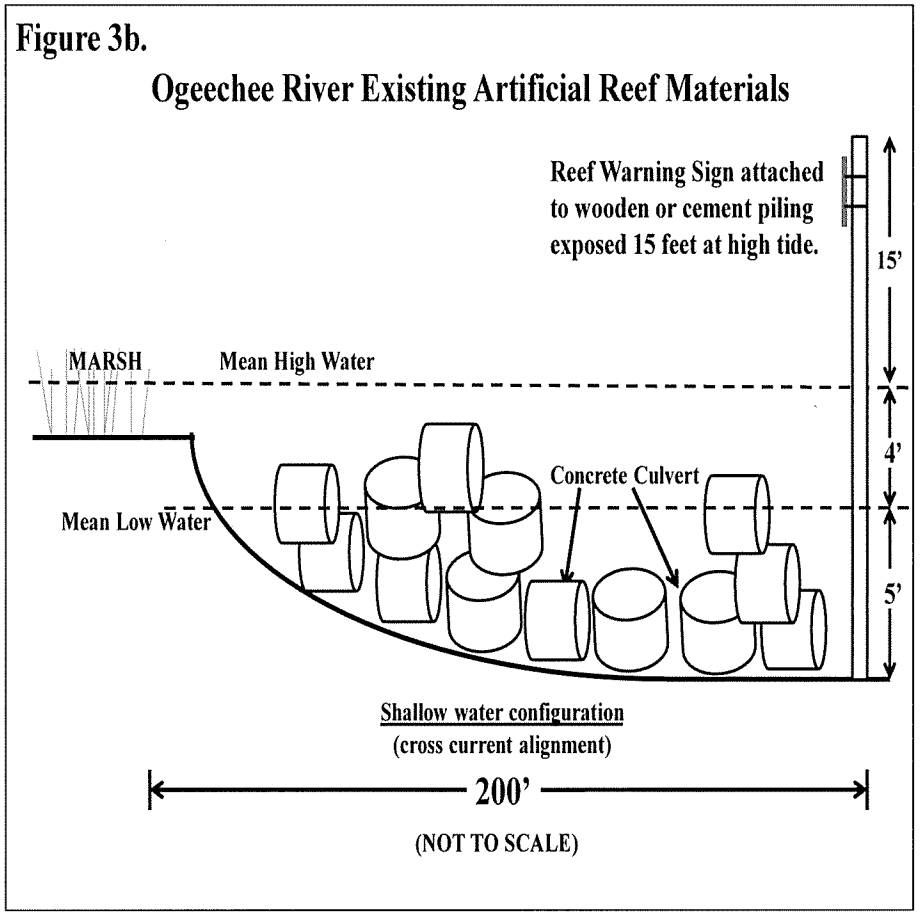


Figure 3b.



APPENDIX VI- Ogeechee River Site

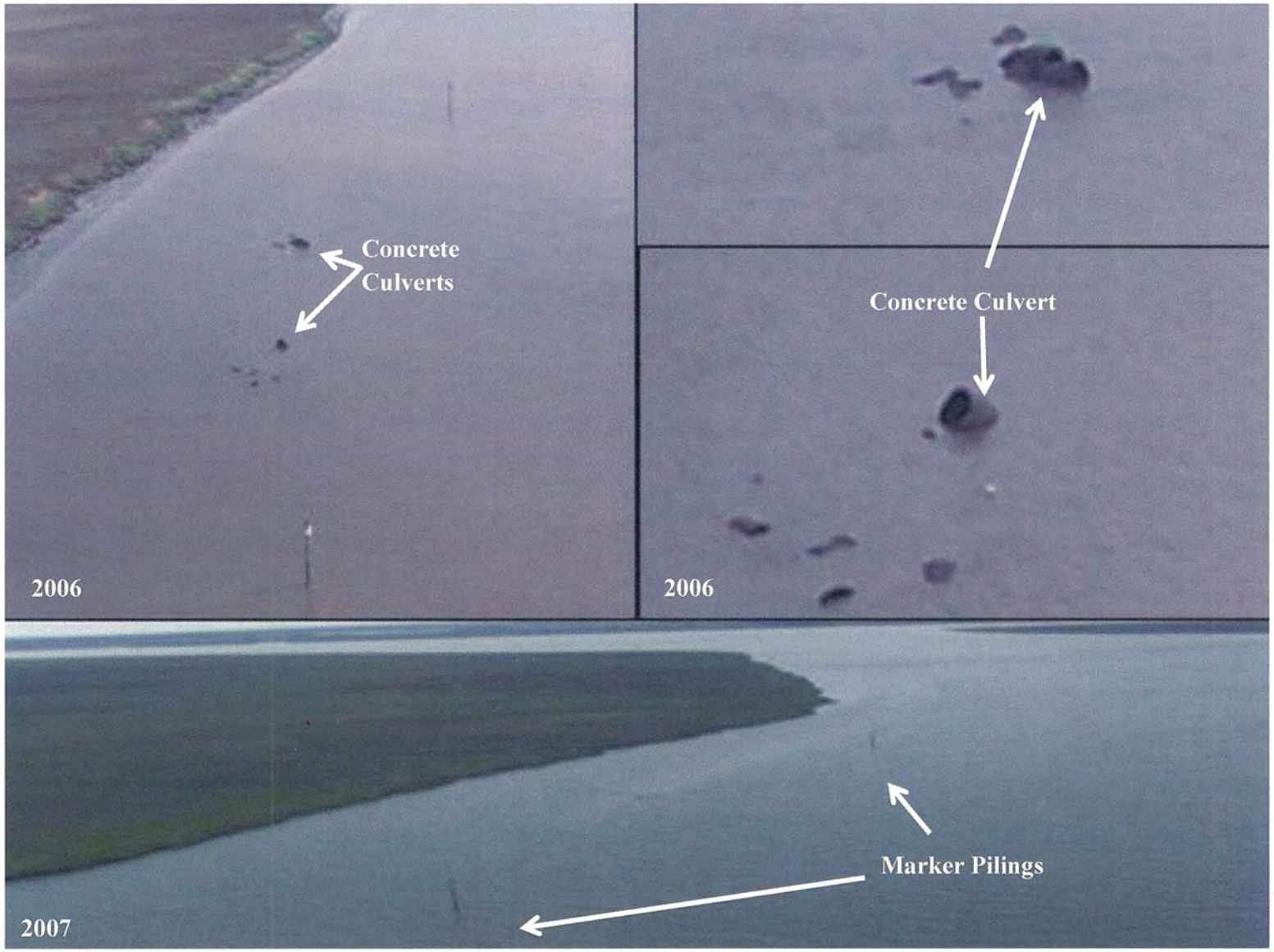


Figure 4a. Ogeechee River reference photographs from helicopter over-flights: 2006-2007.

APPENDIX VI- Ogeechee River Site

Figure 4b. Ogeechee River reference photographs from helicopter over-flights: 2012.

APPENDIX VII- Timmons River Site

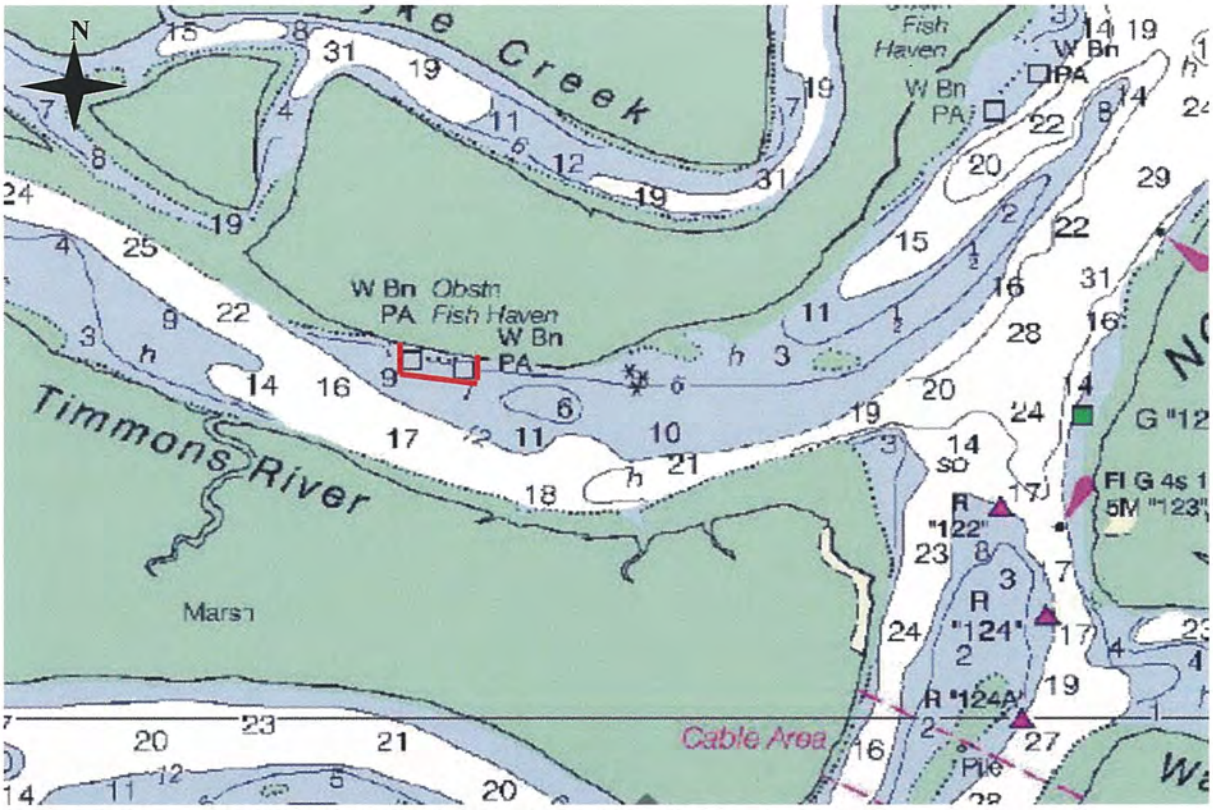


Figure 1. Timmons River Inshore Artificial Reef Site Shown in Red
Nautical Chart #11511 (NOAA: Ossabaw and St. Catherines Sounds)

Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (800' x 200'). For navigational purposes the southernmost piling is outlined in red.

APPENDIX VII- Timmons River Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name:	**31.677383° / -81.215250°**	160,000 Ft^2	0.0 nm	0.0 nm	0.12 nm	0.0 nm	17 Feet	0.2 nm
Timmons River	31.677100° / -81.212950°	3.67 Acres						

Figure 3a.

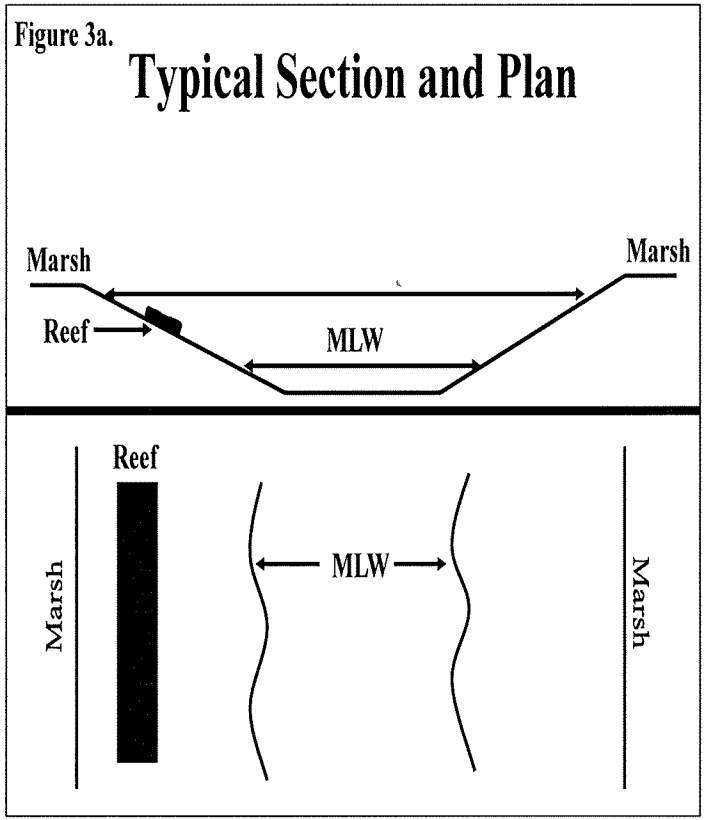
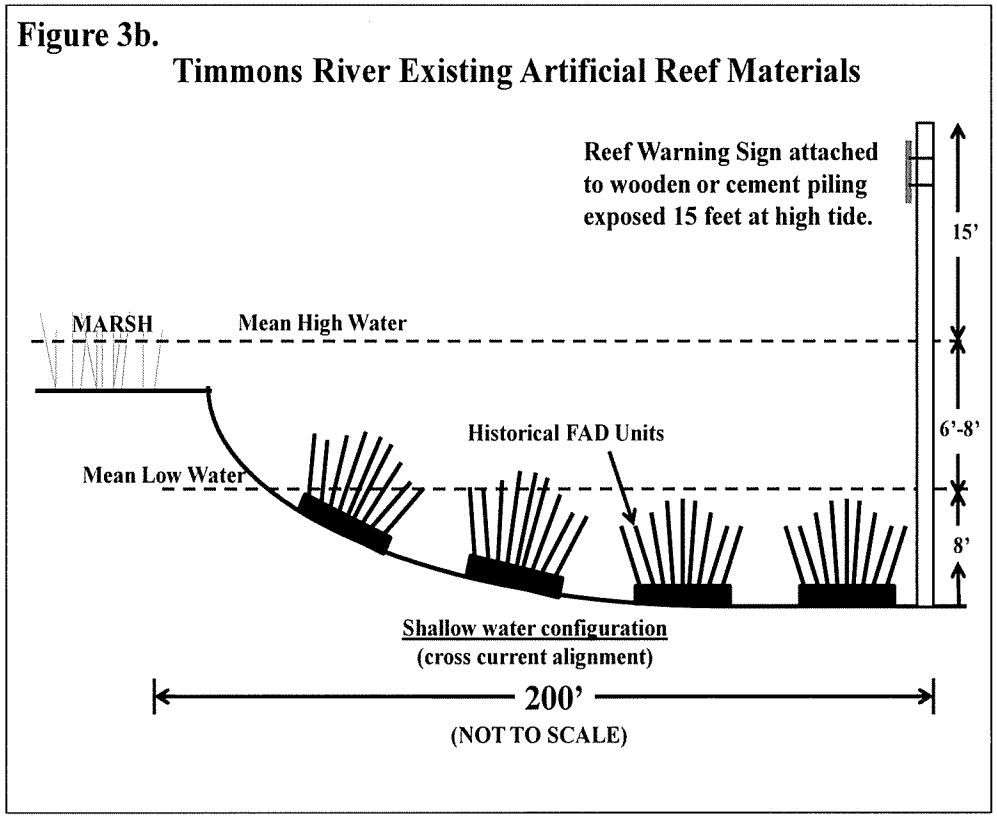


Figure 3b.



APPENDIX VII- Timmons River Site

Figure 4. Timmons River reference photographs from helicopter over-flights: 2006-2007 and 2012.

APPENDIX VIII- Van Dyke Creek Site

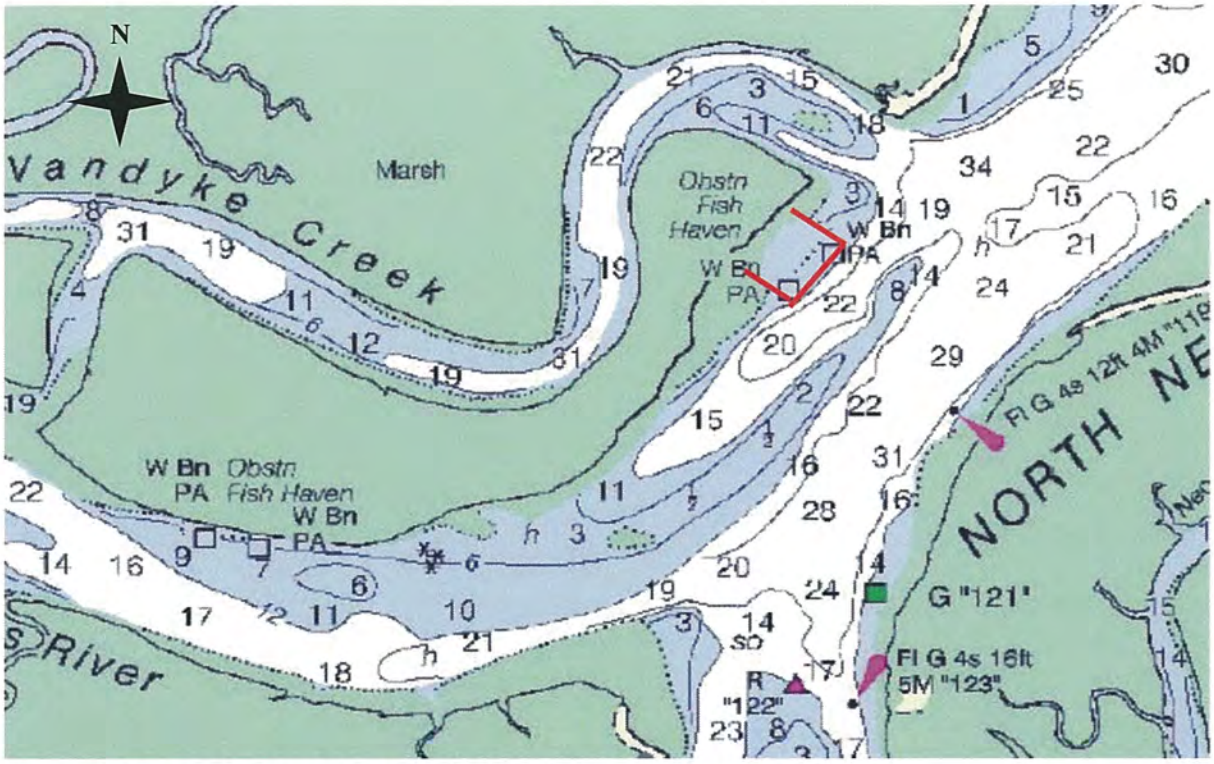


Figure 1. Van Dyke Creek Inshore Artificial Reef Site Shown in Red
Nautical Chart #11511 (NOAA: Ossabaw and St. Catherines Sounds)

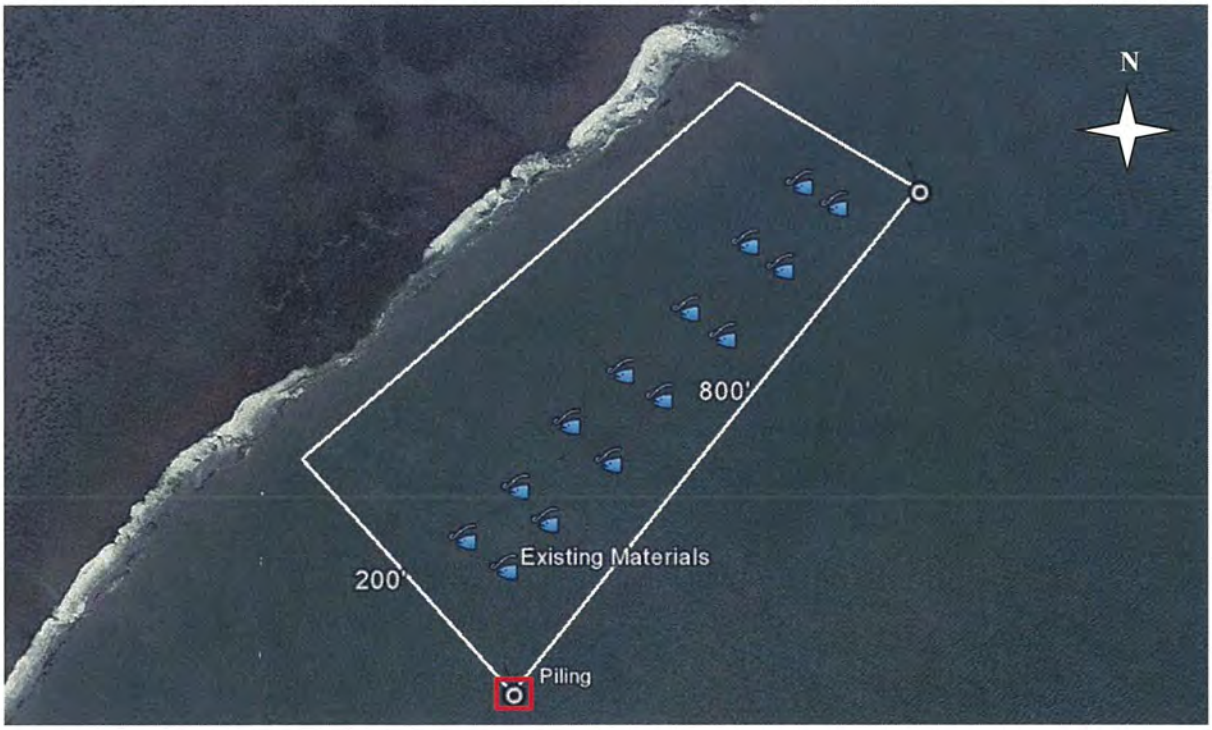


Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (800' x 200'). For navigational purposes the southernmost piling is outlined in red.

APPENDIX VIII- Van Dyke Creek Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name:	**31.685450° / -81.198167°**	160,000 Ft^2	0.0 nm	0.0 nm	0.20 nm	0.0 nm	29 Feet	0.43 nm
Van Dyke Creek	31.687067° / -81.196633°	3.67 Acres						

Figure 3a.

Typical Section and Plan

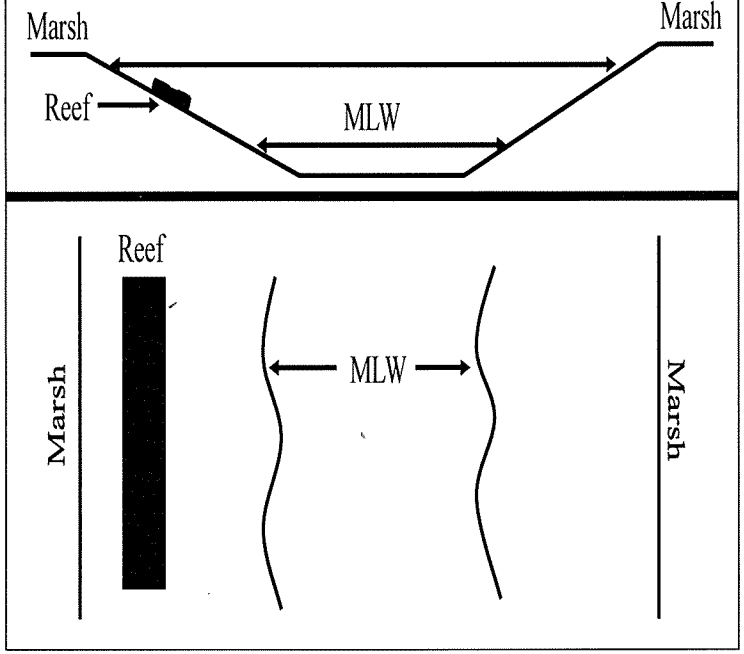
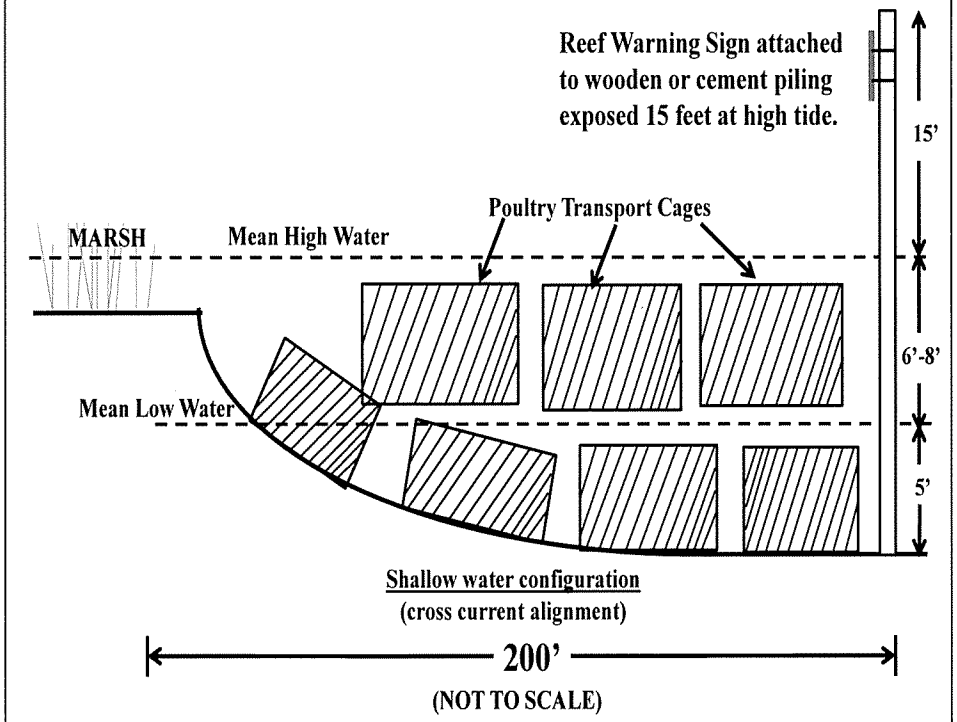


Figure 3b.

Van Dyke Creek Existing Artificial Reef Materials



APPENDIX VIII- Van Dyke Creek Site

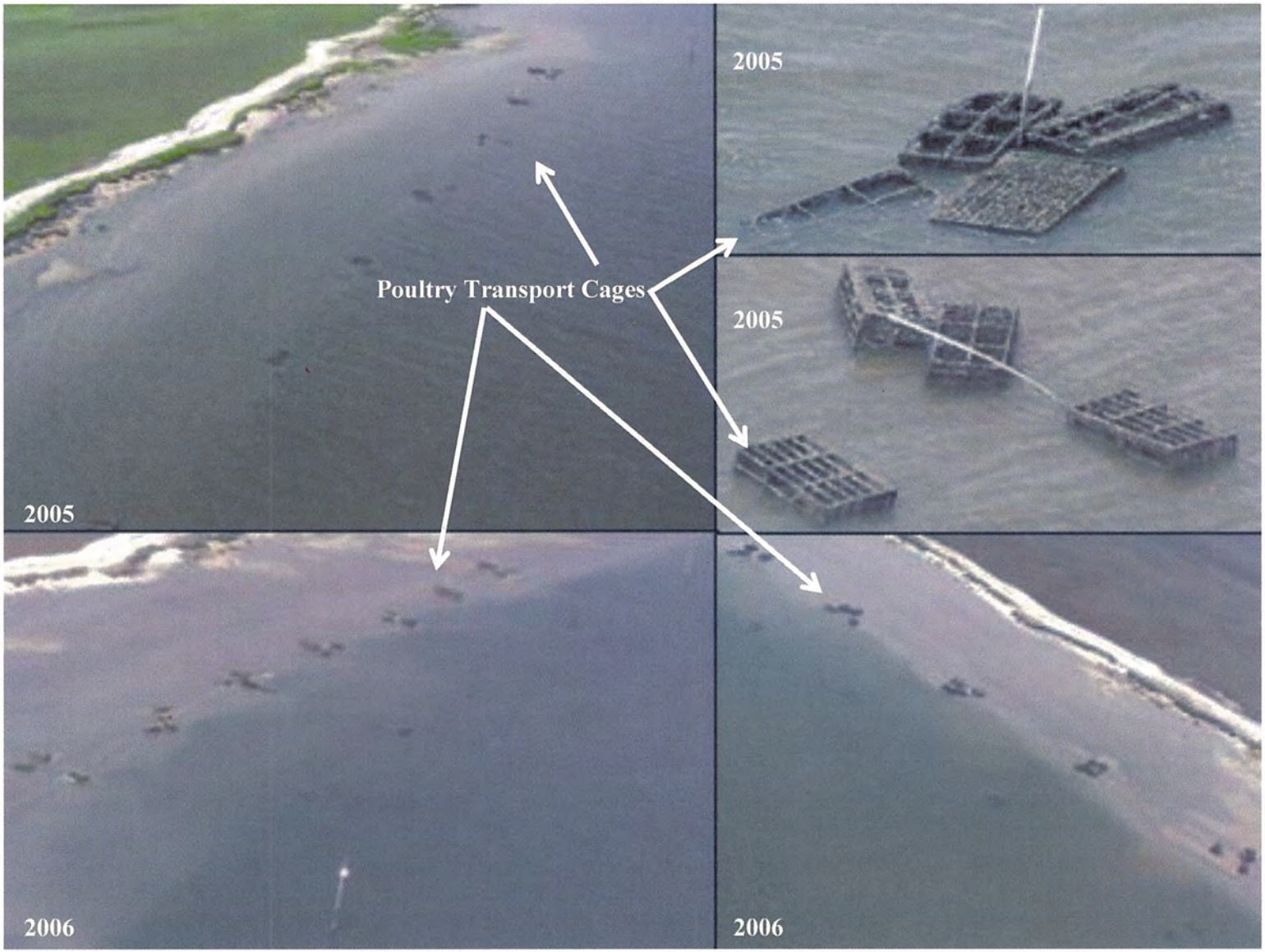


Figure 4a. Van Dyke Creek reference photographs from helicopter over-flights: 2005-2006.

APPENDIX VIII- Van Dyke Creek Site

Figure 4b. Van Dyke Creek reference photographs from helicopter over-flights: 2007 and 2012.

APPENDIX IX- Bear River Site

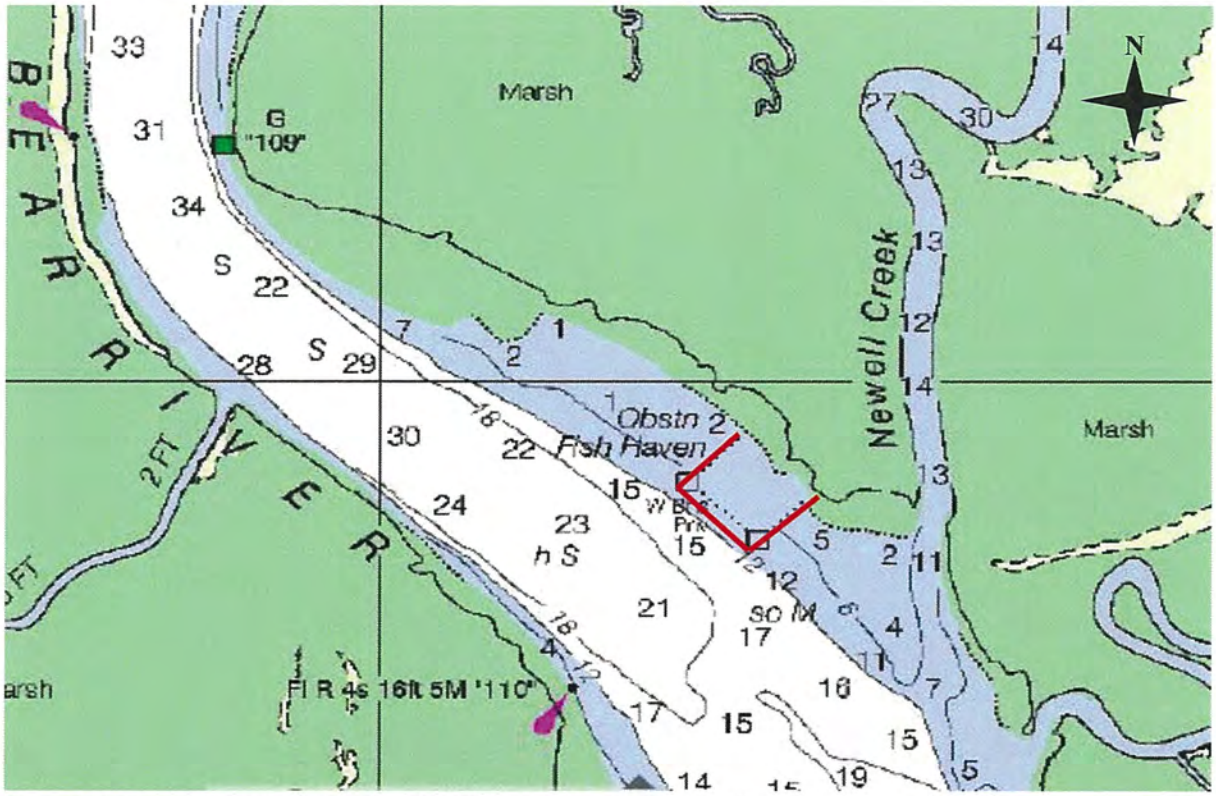


Figure 1. Bear River Inshore Artificial Reef Site Shown in Red
Nautical Chart #11511 (NOAA: Ossabaw and St. Catherines Sounds)

Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (1,000' x 800'). For navigational purposes the southernmost piling is outlined in red.

APPENDIX IX- Bear River Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name:	**31.745333° / -81.155050°**	800,000 Ft^2	0.0 nm	0.10 nm	0.10 nm	0.0 nm	21 Feet	0.35 nm
Bear River	31.747183° / -81.157050°	18.37Acres						

Figure 3a.

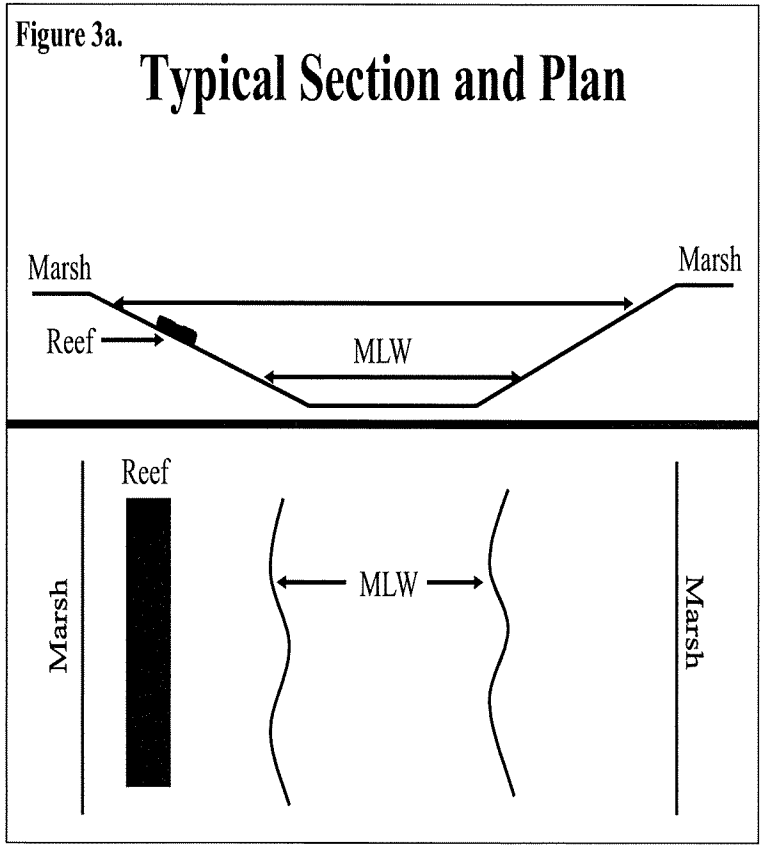
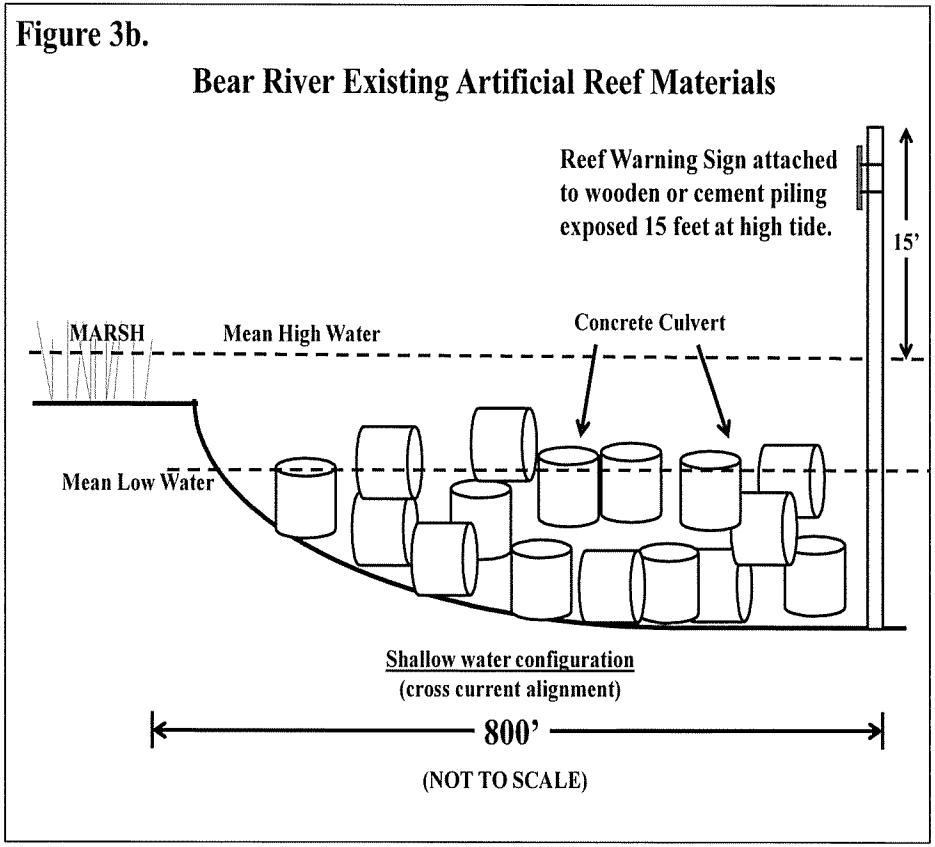


Figure 3b.



APPENDIX IX- Bear River Site

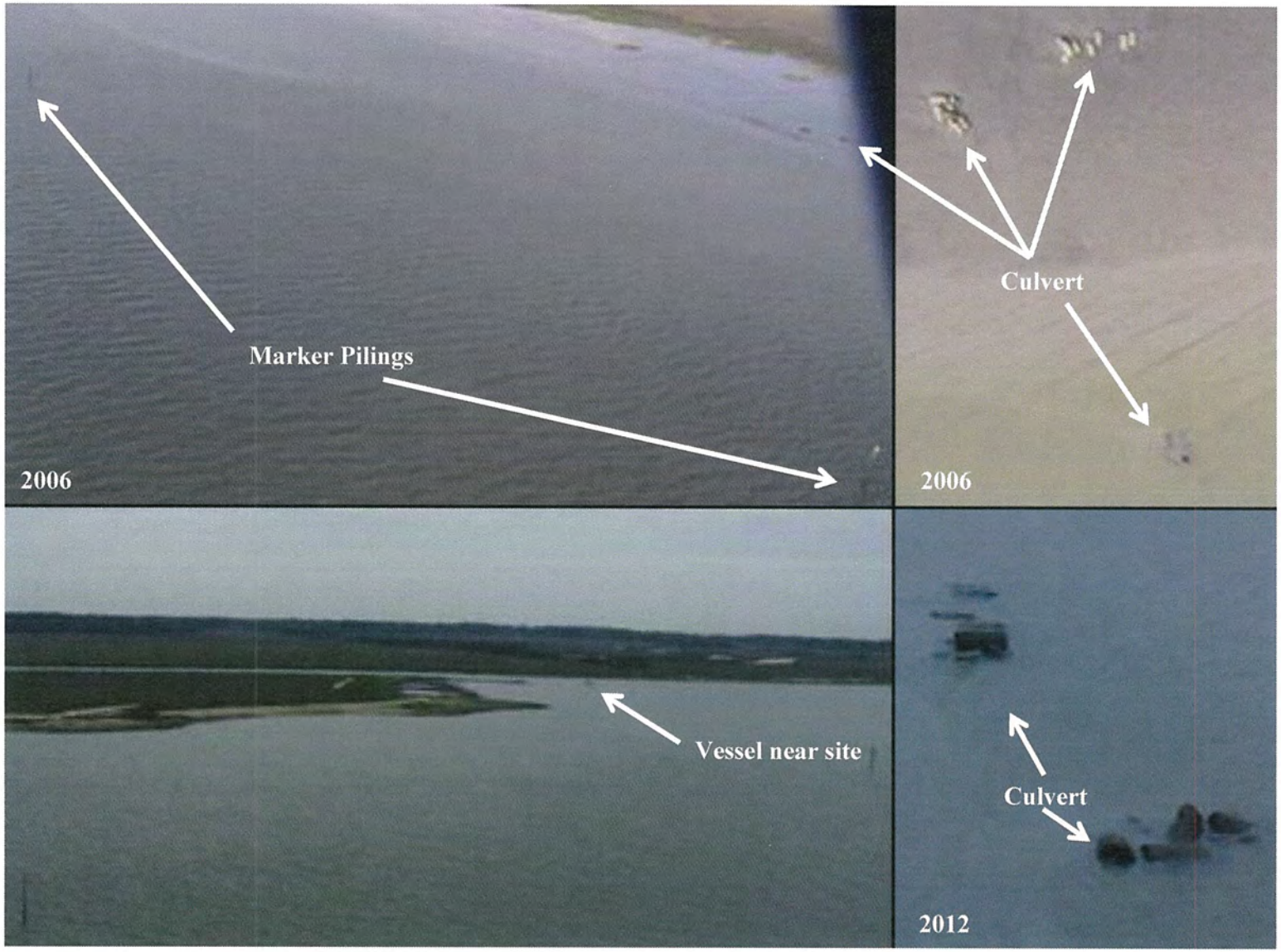


Figure 4a. Bear reference photographs from helicopter over-flights: 2006-2007 and 2012.

APPENDIX IX- Bear River Site

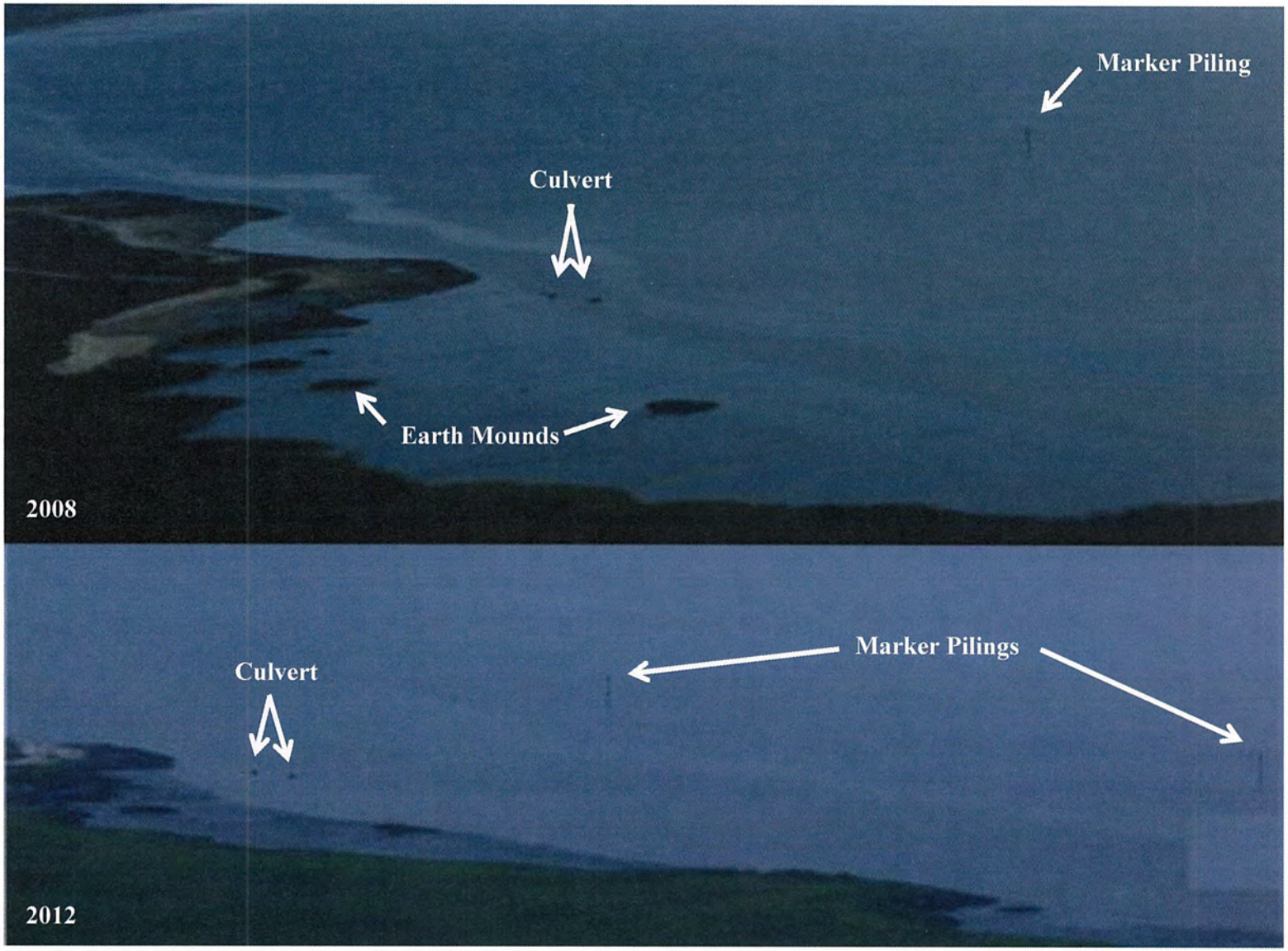


Figure 4b. Bear River reference photographs from helicopter over-flights: 2008 and 2012.

APPENDIX X- Four Mile Island Site

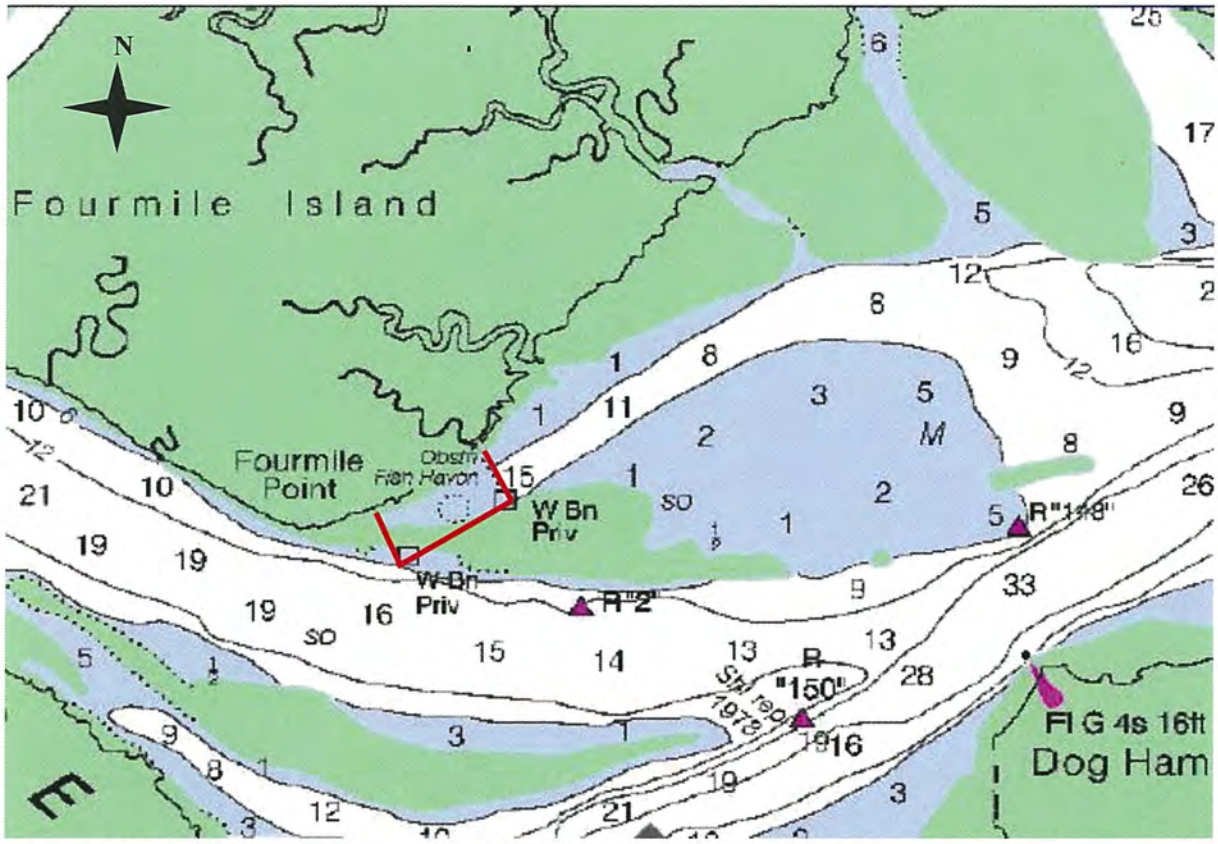


Figure 1. Four Mile Island Inshore Artificial Reef Site Shown in Red
Nautical Chart #11510 (NOAA: Sapelo and Doboy Sounds

Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (800' x 200'). For navigational purposes the southernmost piling is outlined in red

APPENDIX X- Four Mile Island Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name:	**31.536283° / -81.290550°**	160,000 Ft^2	0.0 nm	0.0 nm	0.29 nm	0.0 nm	15 Feet	0.25 nm
Four Mile Island	31.537683° / -81.288500°	3.67 Acres						

Figure 3a.

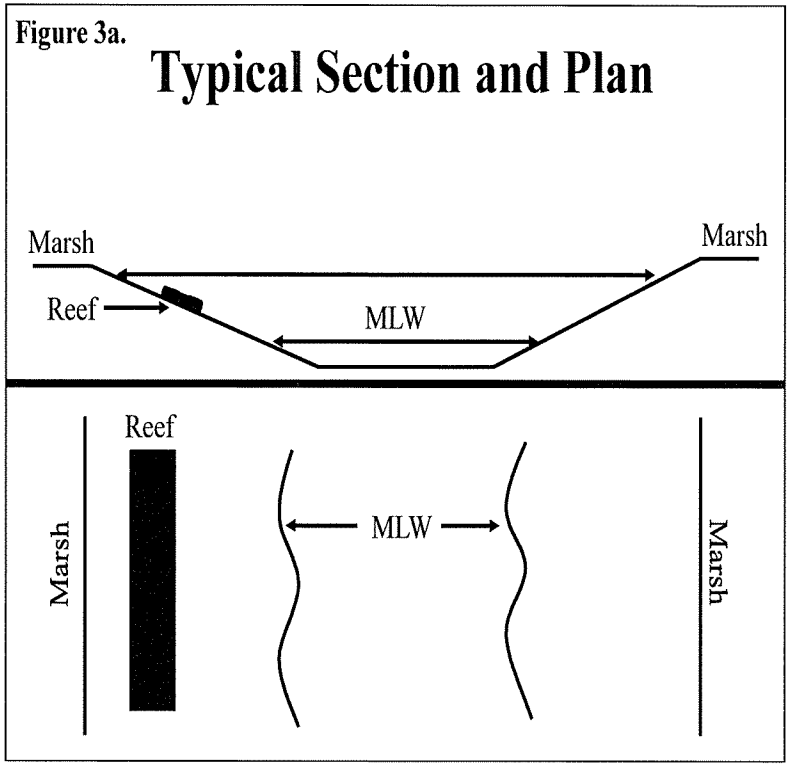
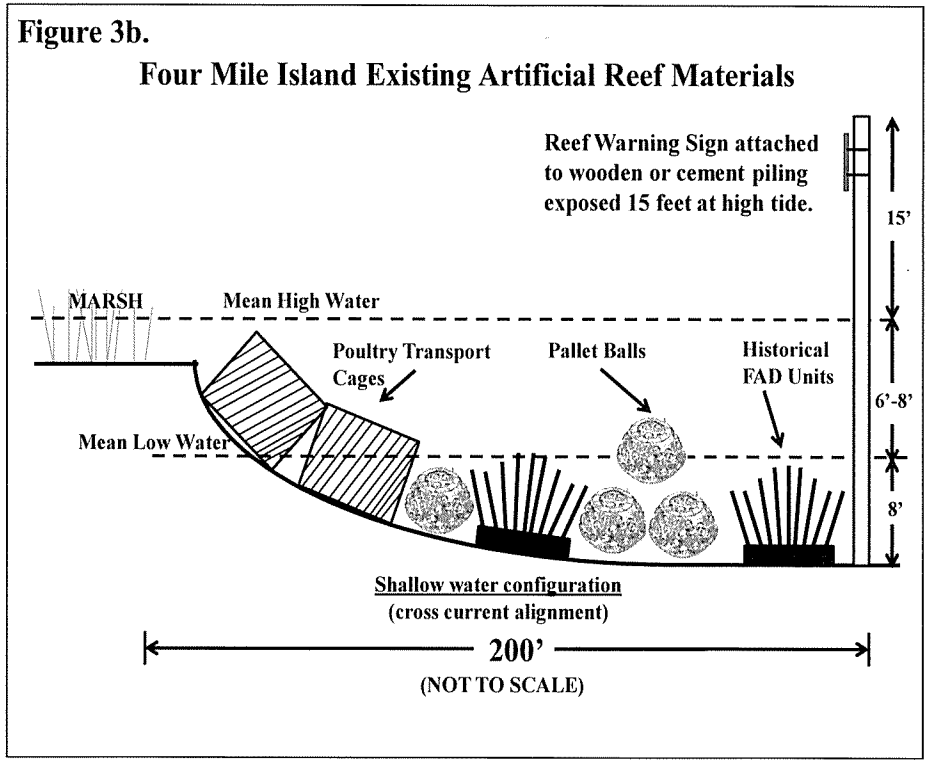


Figure 3b.



APPENDIX X- Four Mile Island Site

Figure 4a. Four Mile Island reference photographs from helicopter over-flights: 2006.

Figure 4b. Four Mile Island reference photographs from helicopter over-flights: 2007 and 2012.

APPENDIX XI- High Point Site

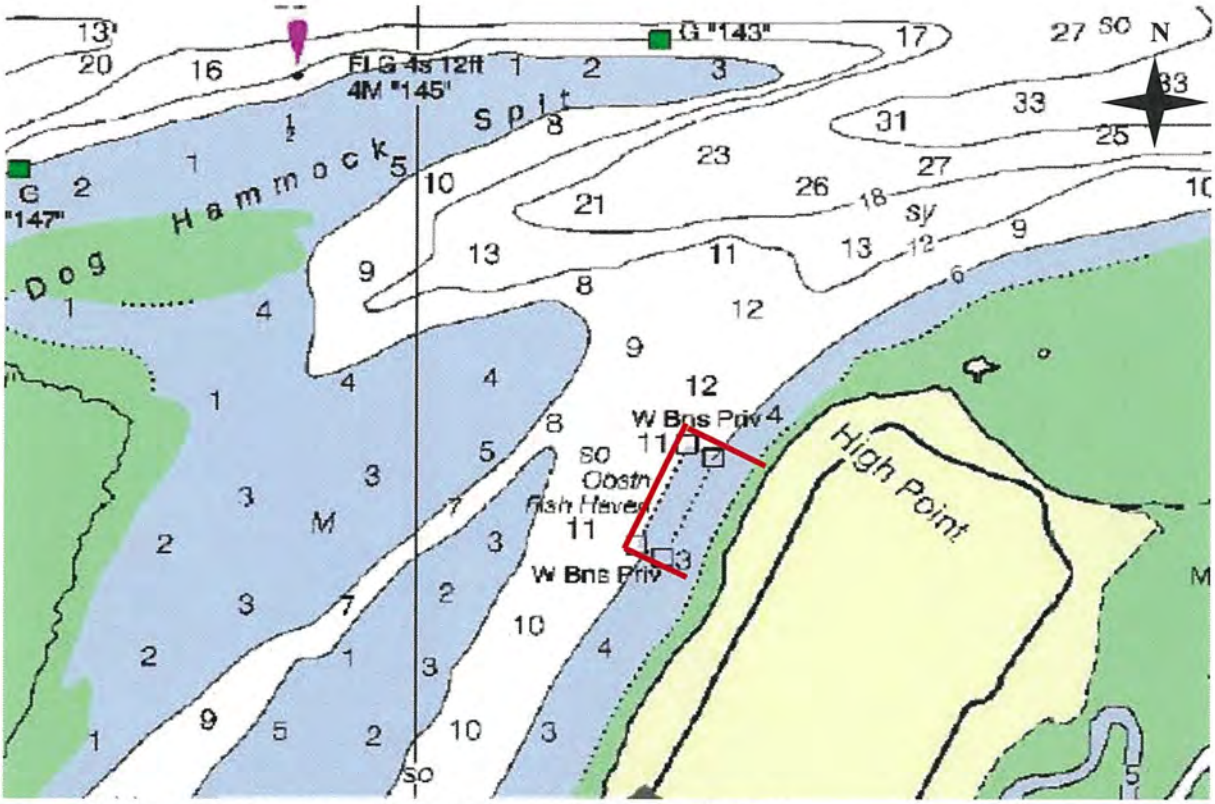


Figure 1. High Point Inshore Artificial Reef Site Shown in Red
Nautical Chart #11510 (NOAA: Sapelo and Doboy Sounds)

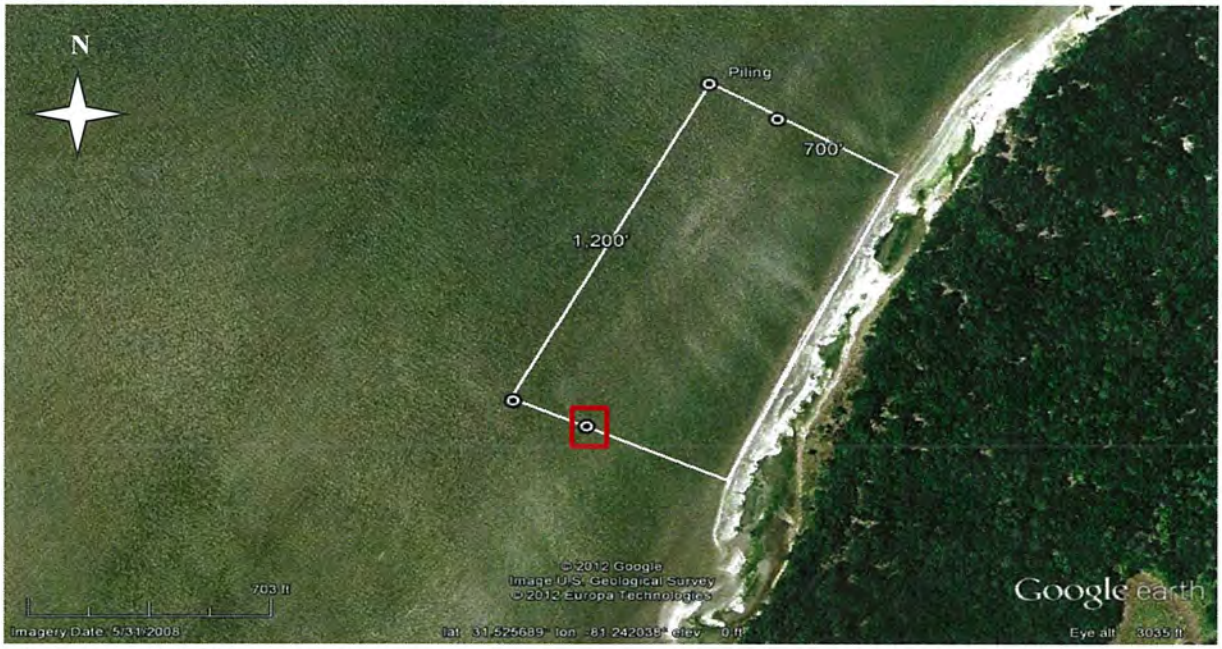


Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (1,200' x 700'). For navigational purposes the southernmost piling is outlined in red.

APPENDIX XI- High Point Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name: High Point	**31.524700° / -81.242267°**	840,000 Ft^2	0.0 nm	0.0 nm	0.80 nm	0.0 nm	11 Feet	0.7 nm
	31.528050° / -81.241133°	19.28 Acres						
	31.527700° / -81.240500°							
	31.524950° / -81.242950°							

Figure 3a.

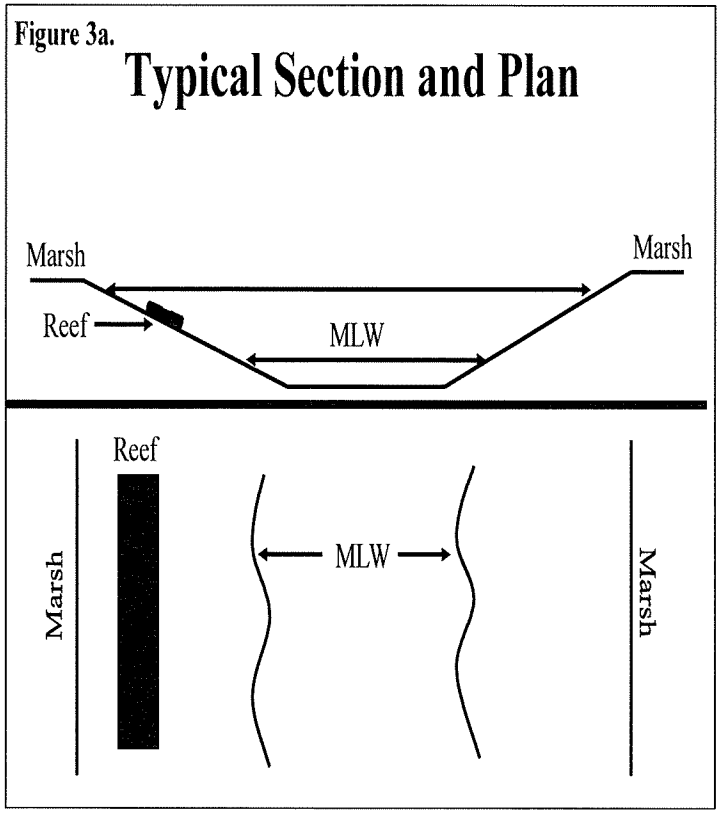
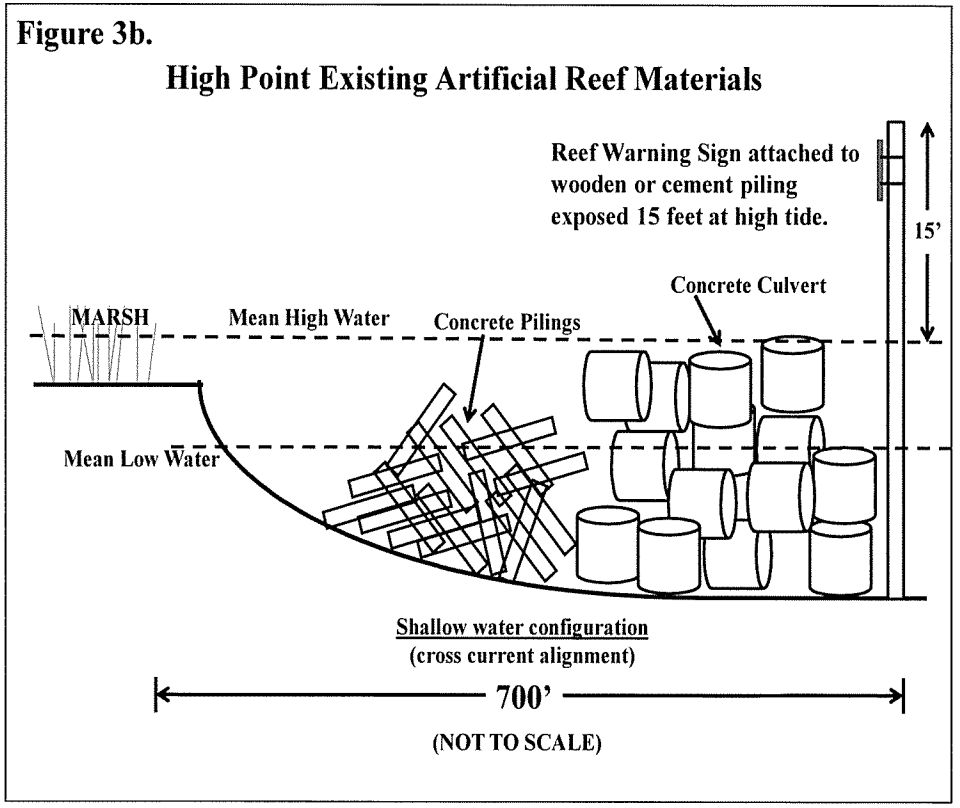


Figure 3b.



APPENDIX VIII- Van Dyke Creek Site

Figure 4b. Van Dyke Creek reference photographs from helicopter over-flights: 2007 and 2012.

APPENDIX IX- Bear River Site

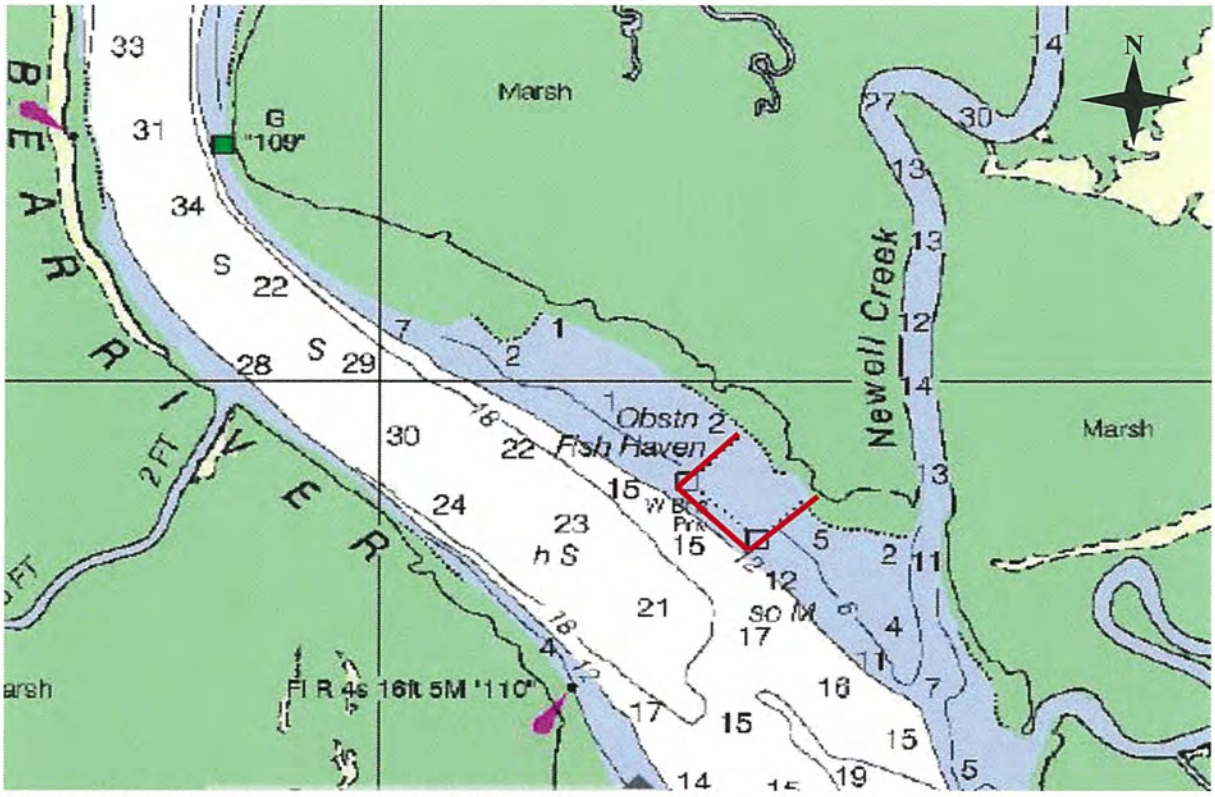


Figure 1. Bear River Inshore Artificial Reef Site Shown in Red
Nautical Chart #11511 (NOAA: Ossabaw and St. Catherines Sounds)

Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (1,000' x 800'). For navigational purposes the southernmost piling is outlined in red.

APPENDIX IX- Bear River Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name:	**31.745333° / -81.155050°**	800,000 Ft^2	0.0 nm	0.10 nm	0.10 nm	0.0 nm	21 Feet	0.35 nm
Bear River	31.747183° / -81.157050°	18.37Acres						

Figure 3a.

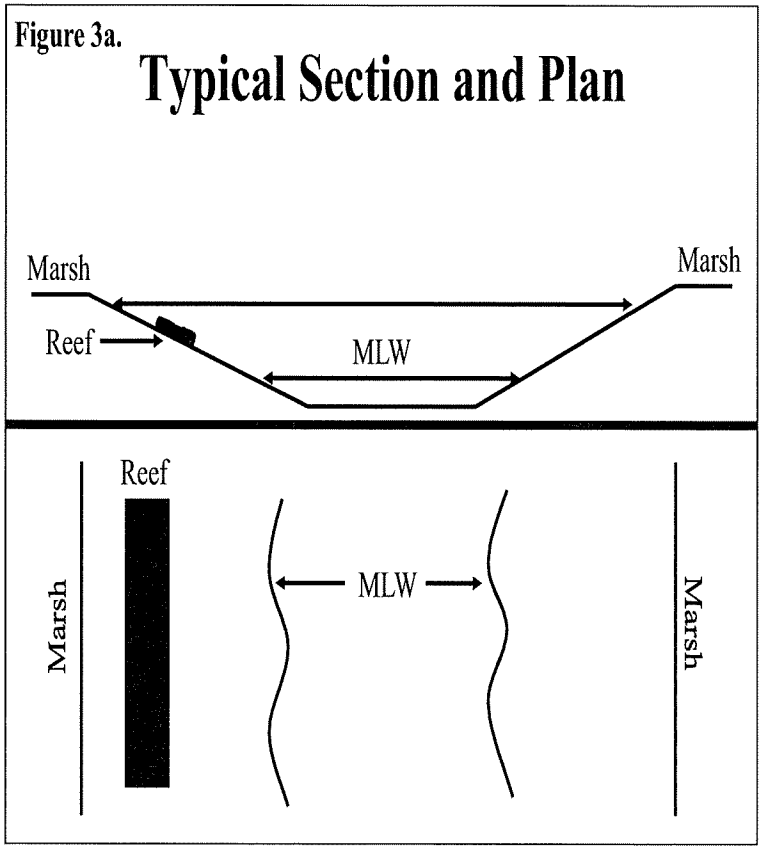
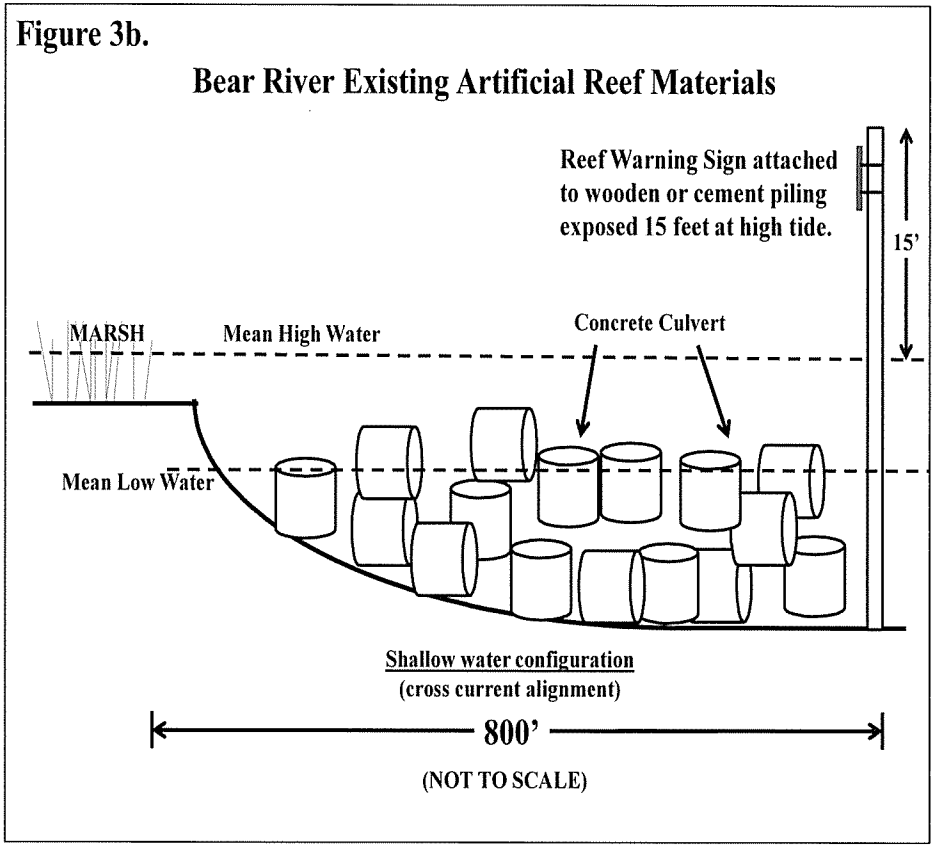


Figure 3b.



APPENDIX IX- Bear River Site

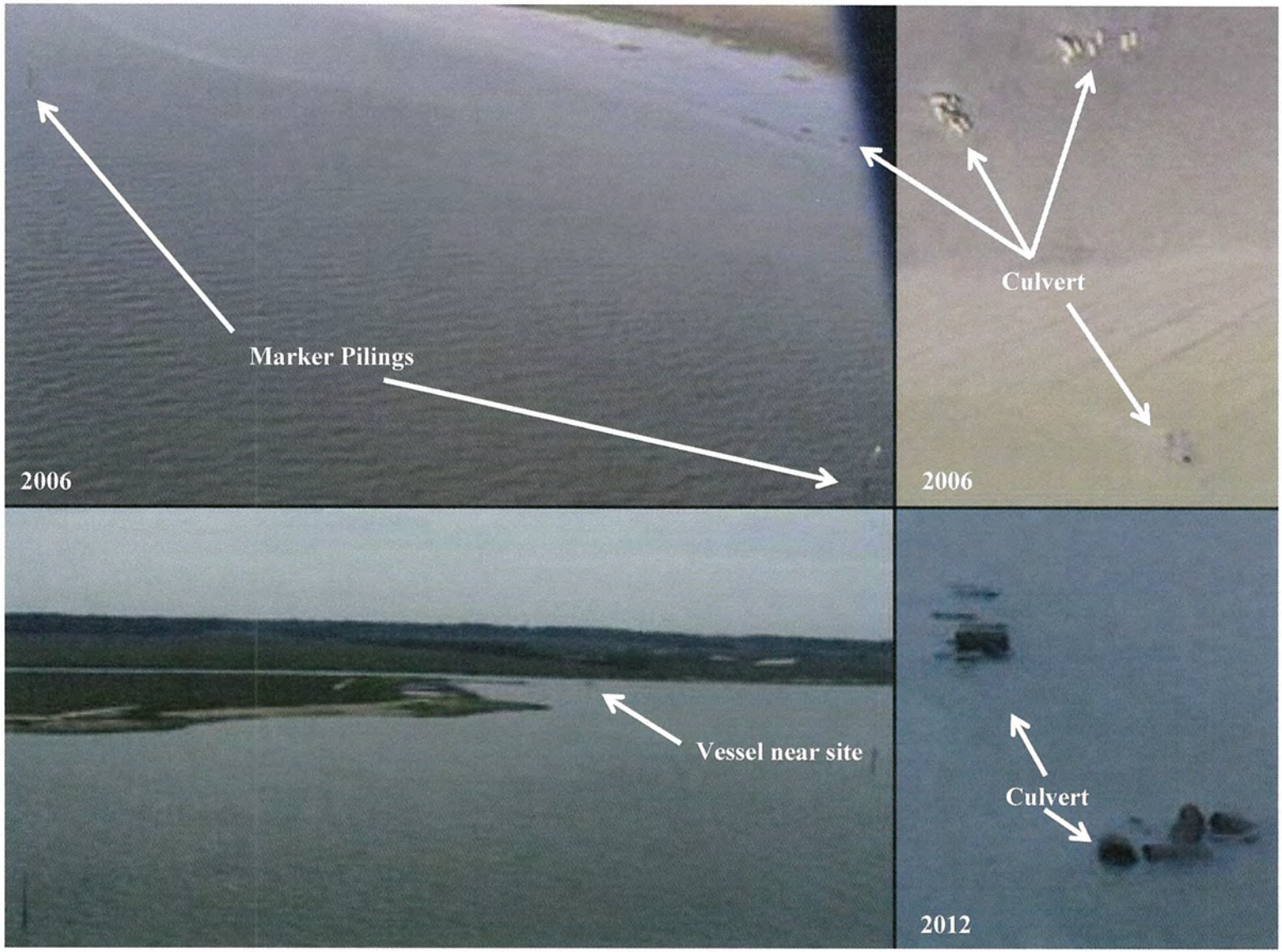


Figure 4a. Bear reference photographs from helicopter over-flights: 2006-2007 and 2012.

APPENDIX IX- Bear River Site

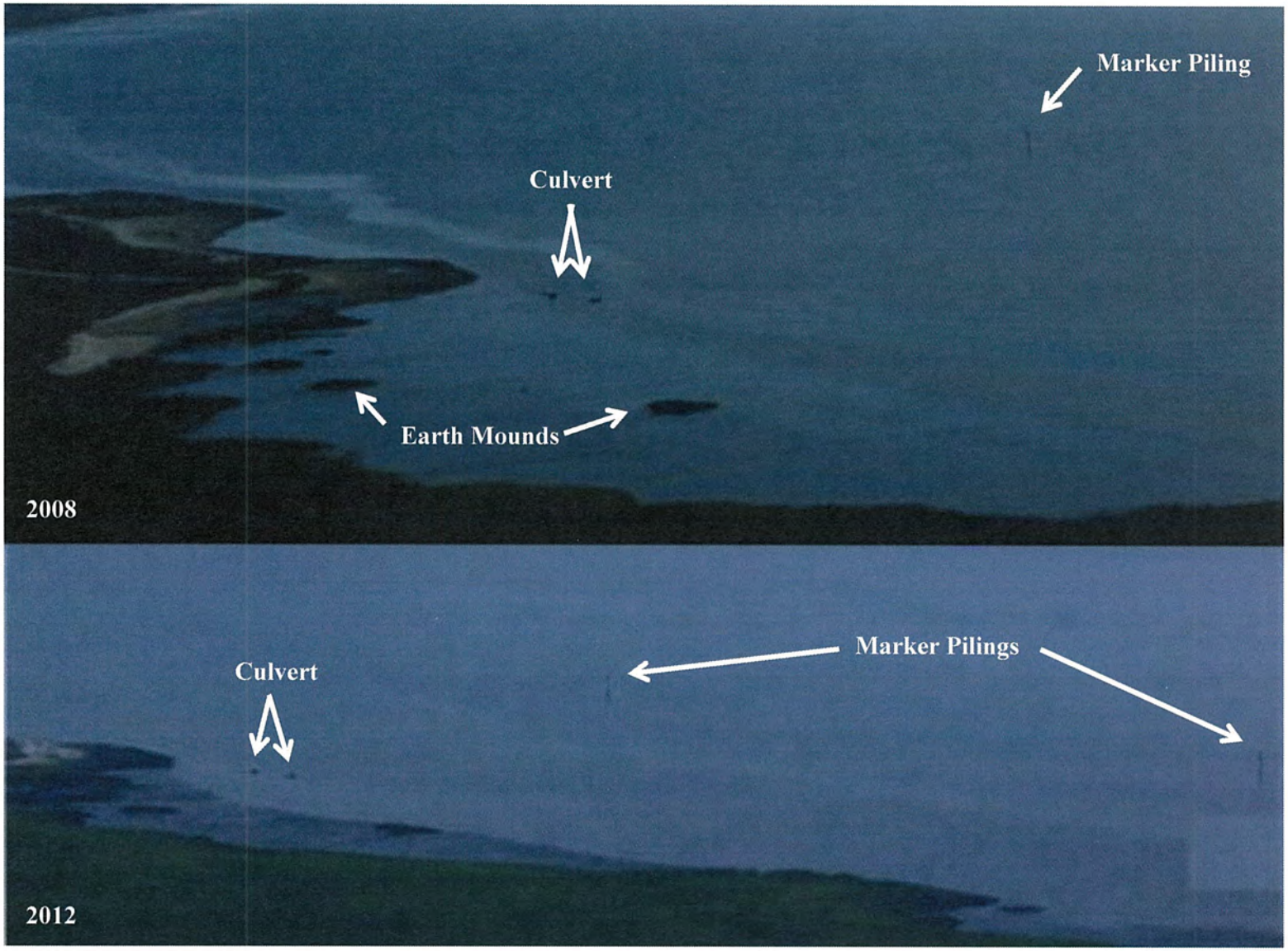


Figure 4b. Bear River reference photographs from helicopter over-flights: 2008 and 2012.

APPENDIX X- Four Mile Island Site

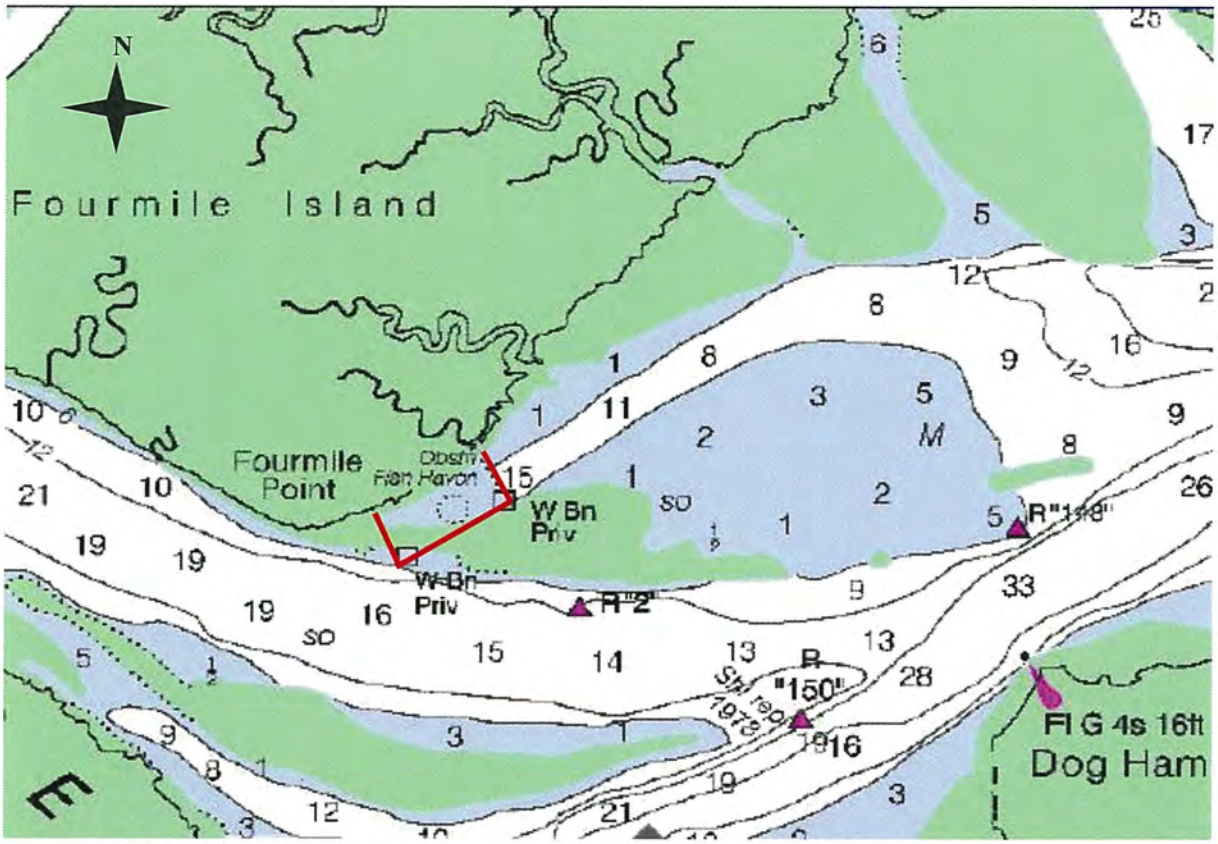


Figure 1. Four Mile Island Inshore Artificial Reef Site Shown in Red
Nautical Chart #11510 (NOAA: Sapelo and Doboy Sounds

Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (800' x 200'). For navigational purposes the southernmost piling is outlined in red

APPENDIX X- Four Mile Island Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name:	**31.536283° / -81.290550°**	160,000 Ft^2	0.0 nm	0.0 nm	0.29 nm	0.0 nm	15 Feet	0.25 nm
Four Mile Island	31.537683° / -81.288500°	3.67 Acres						

Figure 3a.

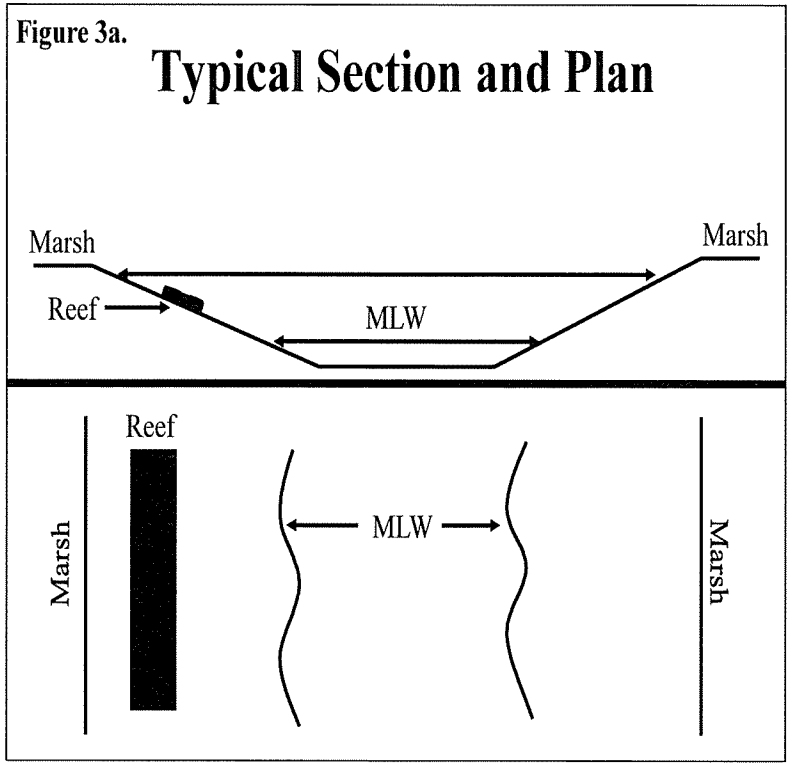
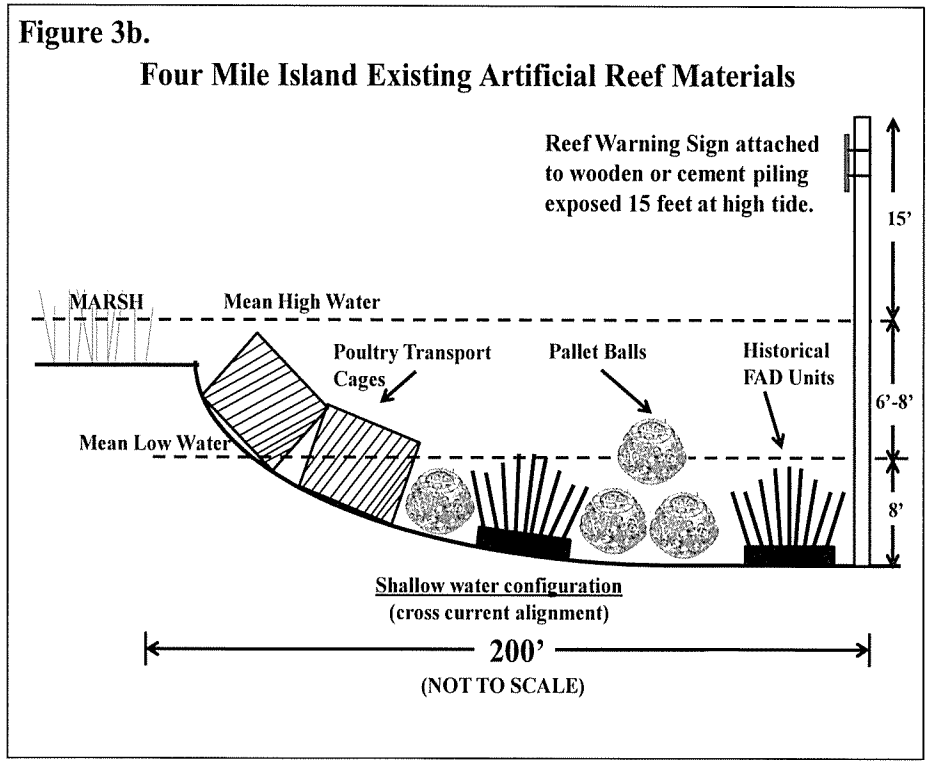


Figure 3b.



APPENDIX X- Four Mile Island Site

Figure 4a. Four Mile Island reference photographs from helicopter over-flights: 2006.

APPENDIX X- Four Mile Island Site

Figure 4b. Four Mile Island reference photographs from helicopter over-flights: 2007 and 2012.

APPENDIX XI- High Point Site

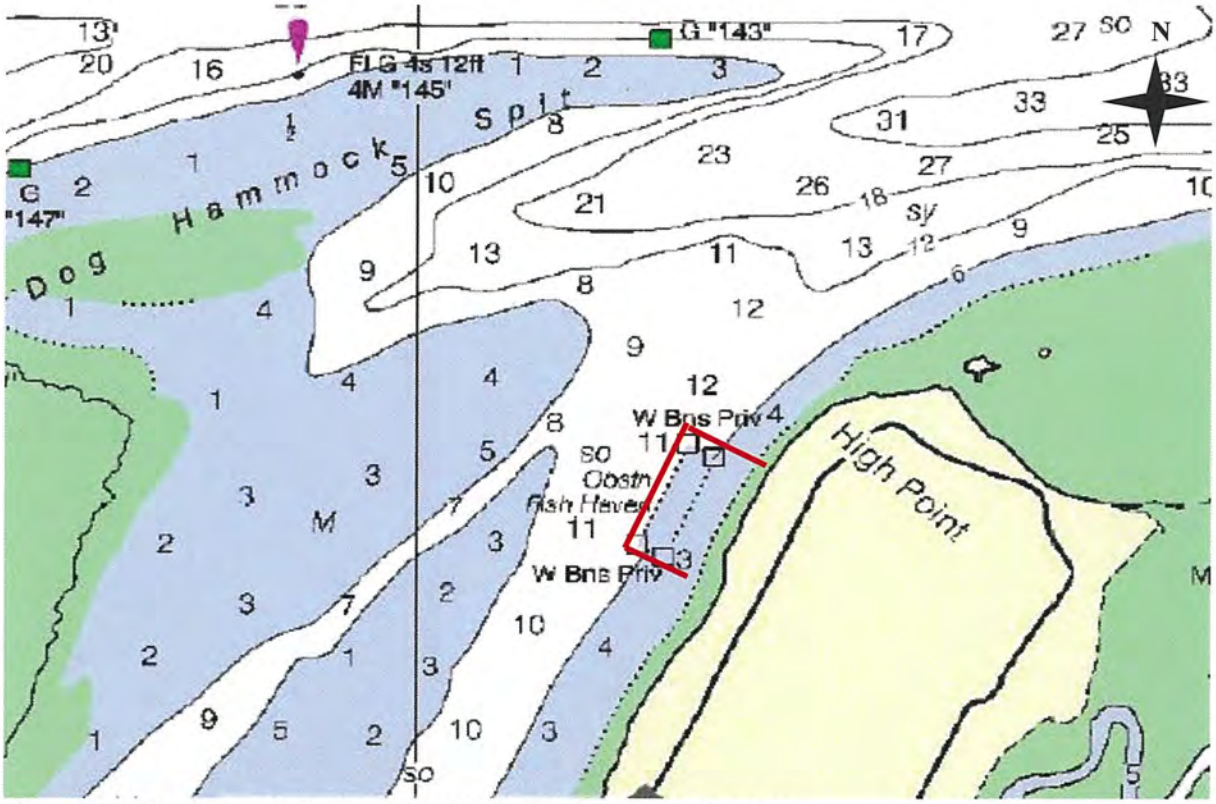


Figure 1. High Point Inshore Artificial Reef Site Shown in Red
Nautical Chart #11510 (NOAA: Sapelo and Doboy Sounds)

Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (1,200' x 700'). For navigational purposes the southernmost piling is outlined in red.

APPENDIX XI- High Point Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name: High Point	**31.524700° / -81.242267°**	840,000 Ft^2	0.0 nm	0.0 nm	0.80 nm	0.0 nm	11 Feet	0.7 nm
	31.528050° / -81.241133°	19.28 Acres						
	31.527700° / -81.240500°							
	31.524950° / -81.242950°							

Figure 3a.

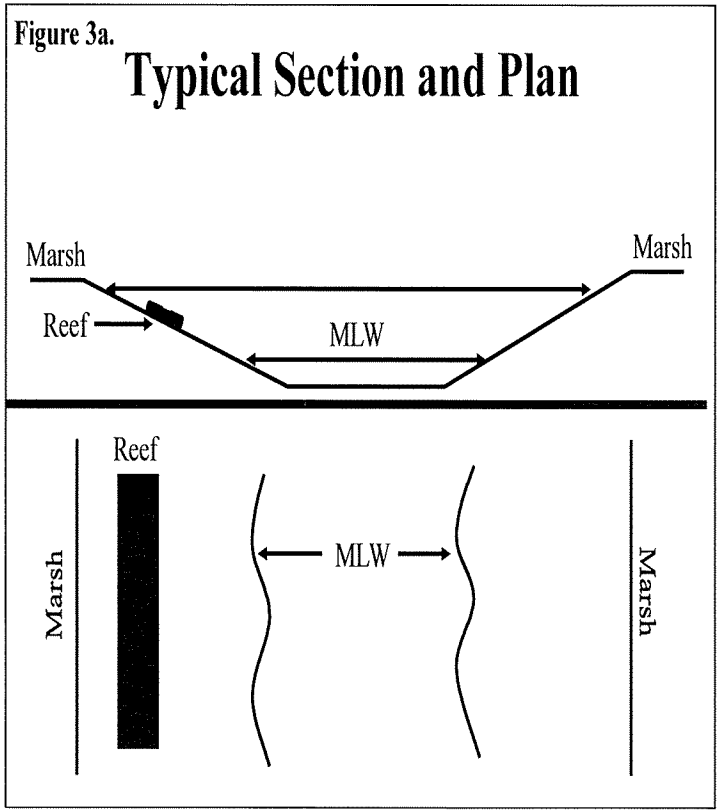
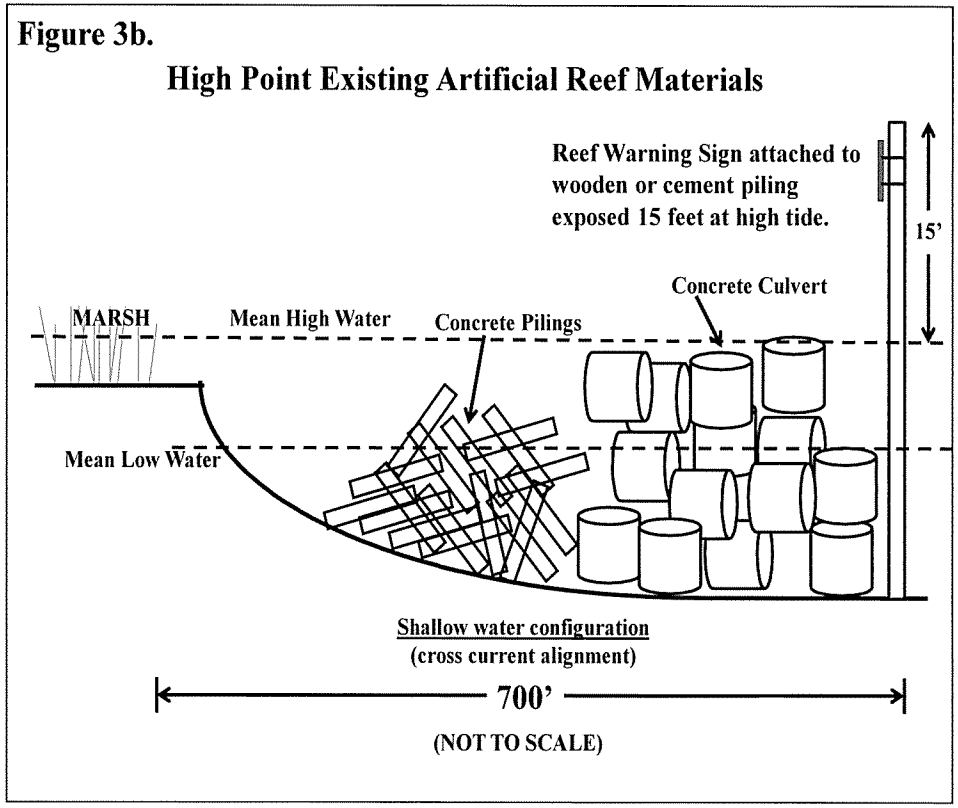


Figure 3b.



APPENDIX XI- High Point Site

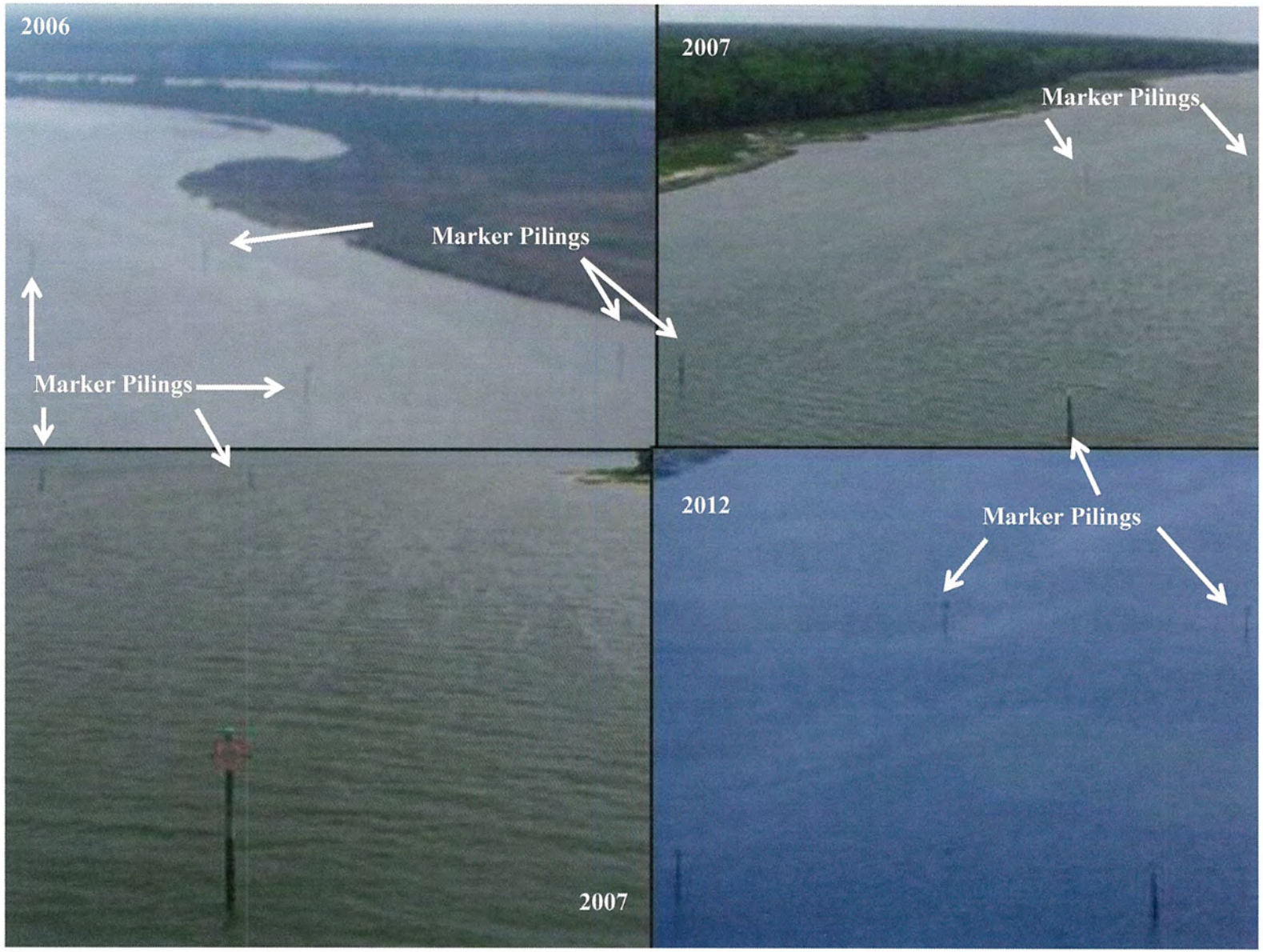


Figure 4. High Point reference photographs from helicopter over-flights: 2006-2007 and 2012.

APPENDIX XII- Troupe Creek Site

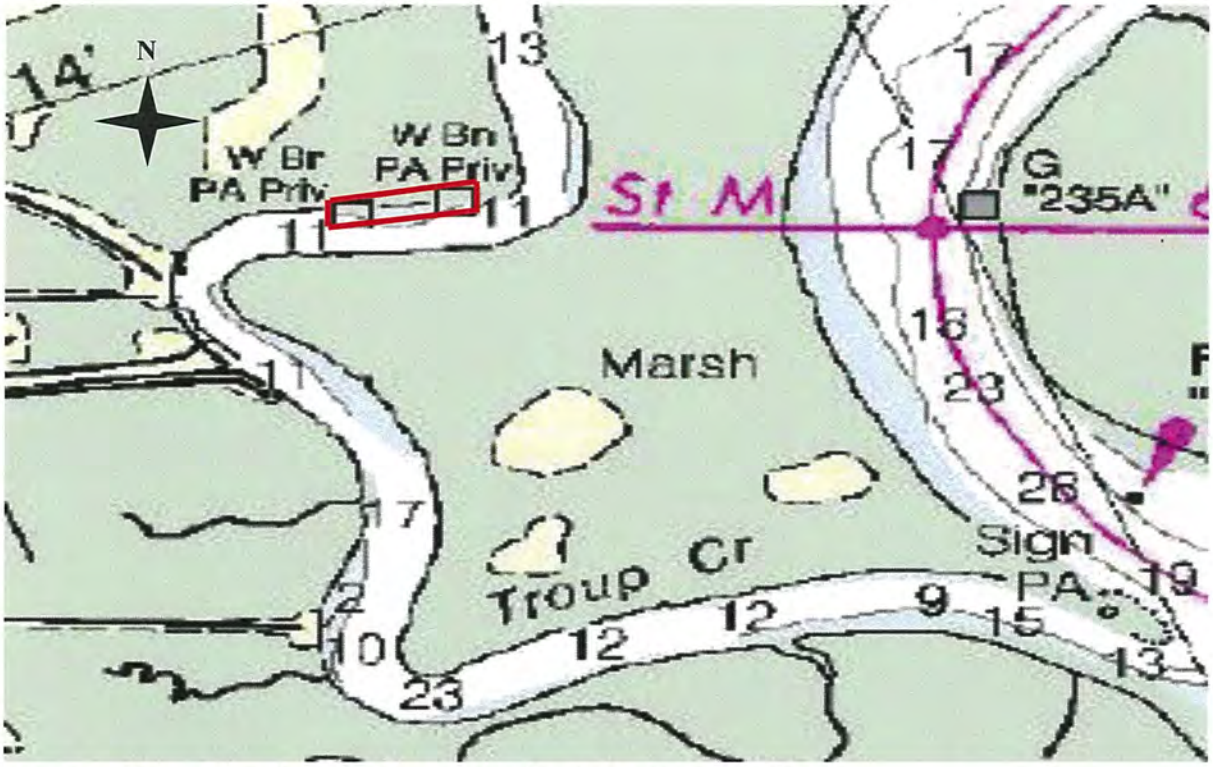


Figure 1. Troupe Creek Inshore Artificial Reef Site Shown in Red
Nautical Chart #11507 (NOAA: Intracoastal Waterway Beafort River to St. Simons Sound)

Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (600' x 100'). For navigational purposes the southernmost piling is outlined in red.

APPENDIX XII- Troupe Creek Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name:	**31.229117° / -81.440617°**	60,000 Ft^2	0.0 nm	0.02 nm	0.01 nm	0.0 nm	11 Feet	0.04 nm
Troupe Creek	31.229633° / -81.442700°	1.38 Acres						

Figure 3a.

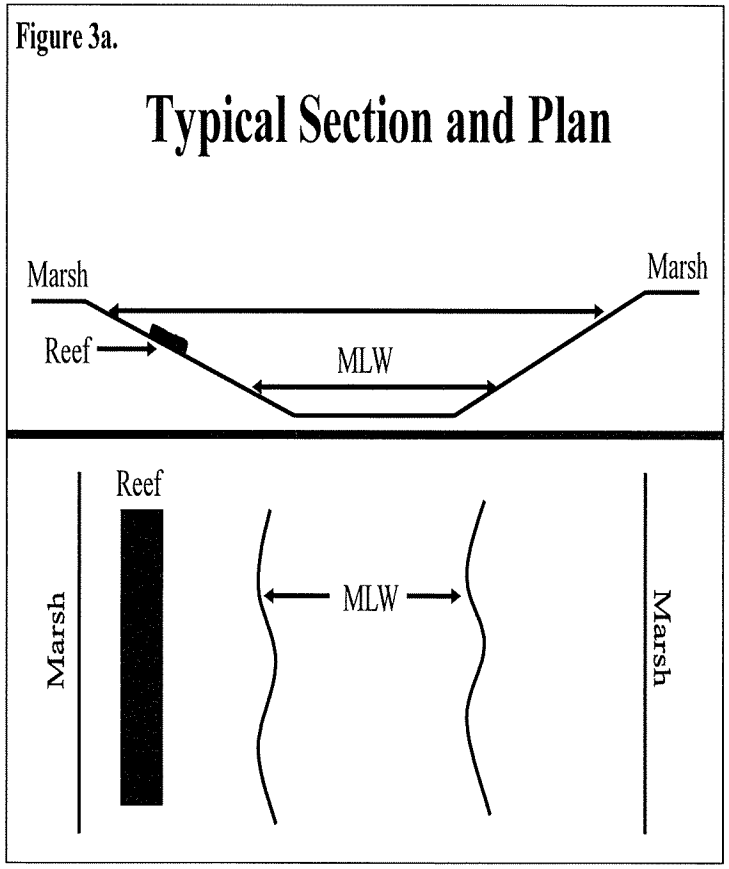
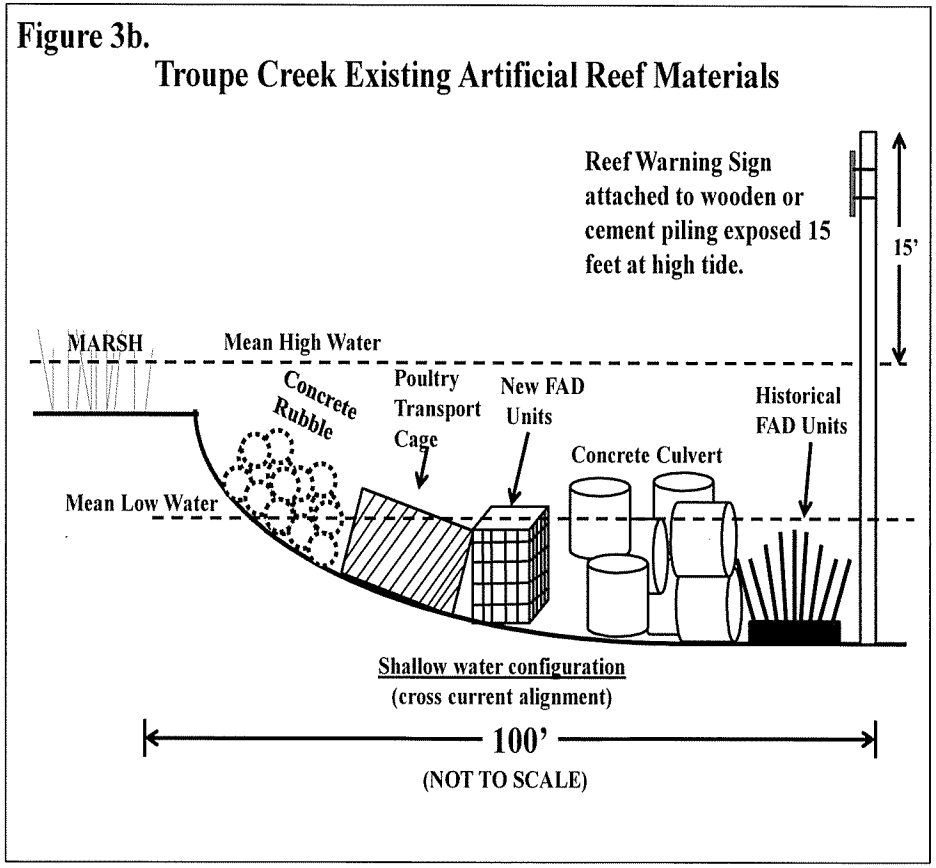


Figure 3b.



APPENDIX XII- Troupe Creek Site

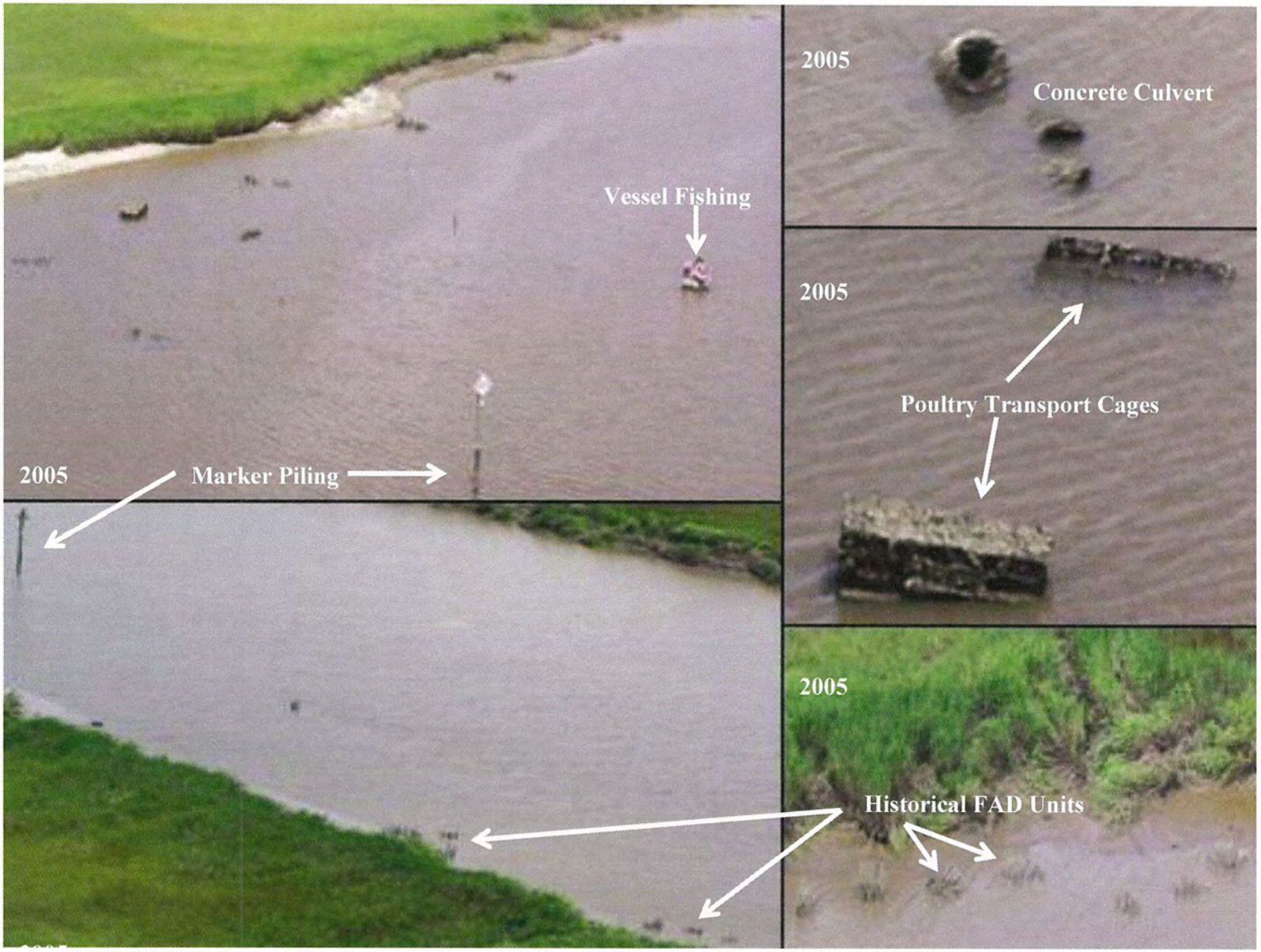


Figure 4a. Troupe Creek reference photographs from helicopter over-flights: 2005.

APPENDIX XII- Troupe Creek Site

Figure 4b. Troupe Creek reference photographs from helicopter over-flights: 2006-2007.

APPENDIX XII- Troupe Creek Site

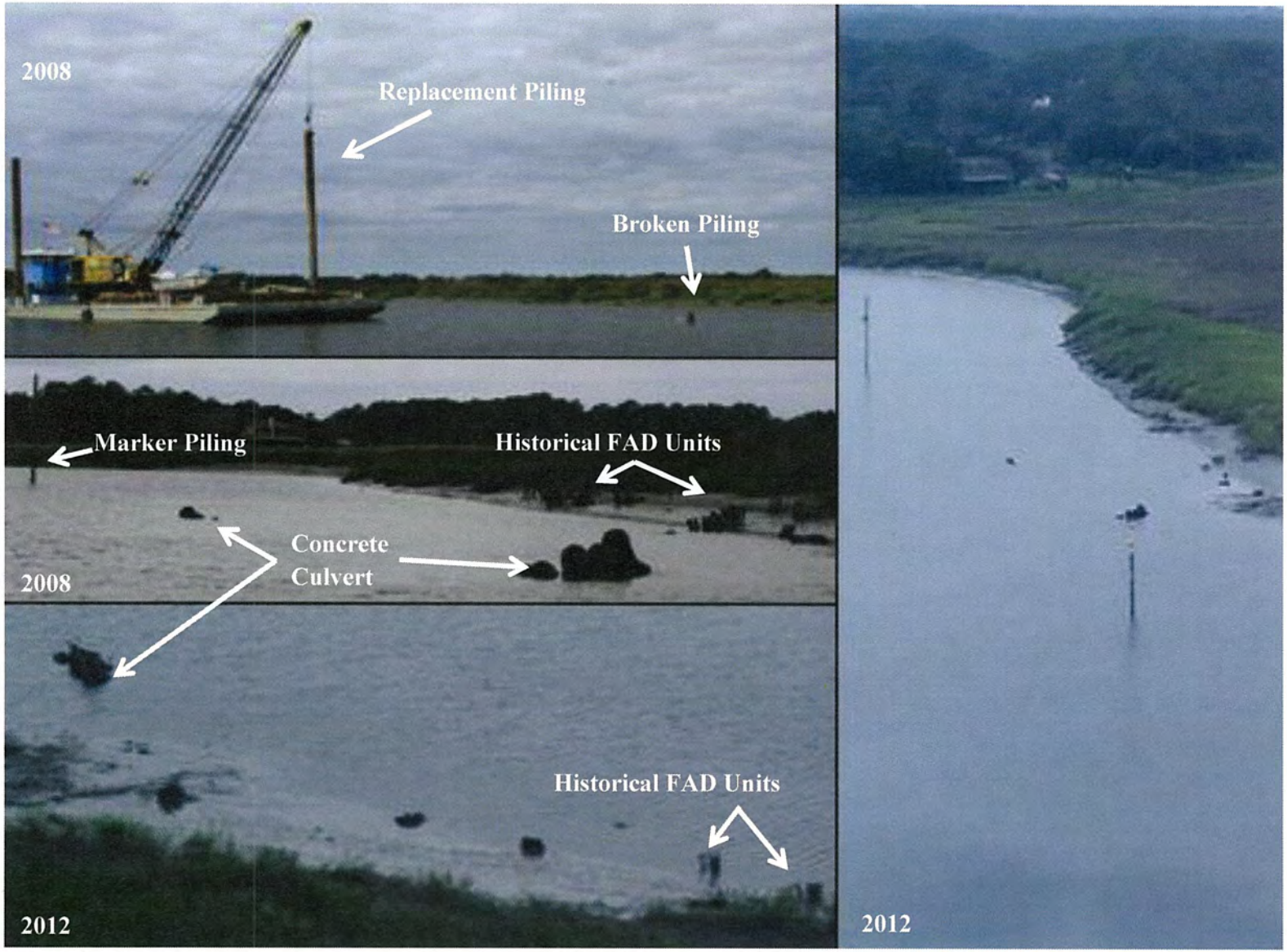


Figure 4c. Troupe Creek reference photographs from 2008 helicopter over-flights and 2012 marker piling replacement. Both wooden pilings were replaced with concrete pilings during 2017.

APPENDIX XIII- Jove Creek Site

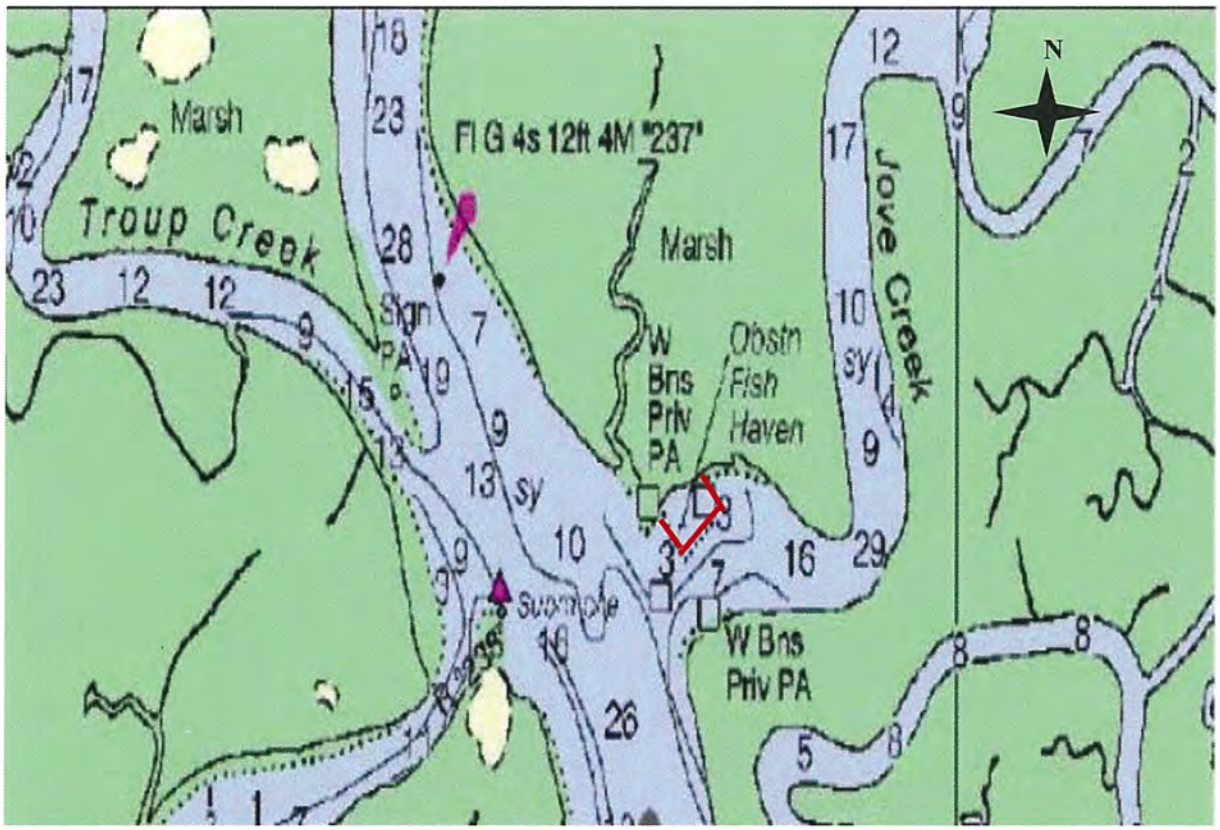


Figure 1. Jove Creek Inshore Artificial Reef Site Shown in Red
Nautical Chart #11506 (NOAA: St. Simons Sound, Brunswick Harbor and Turtle River)

Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (600' x 150'). For navigational purposes the southernmost piling is outlined in red.

APPENDIX XIII- Jove Creek Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name: Jove Creek	**31.216383° / -81.425617°**	90,000 Ft^2	0.0 nm	0.0 nm	0.06 nm	0.0 nm	7 Feet	0.13 nm
	31.216550° / -81.425817°	2.01Acres						
	31.217000° / -81.424033°							
	31.217233° / -81.424133°							

Figure 3a.

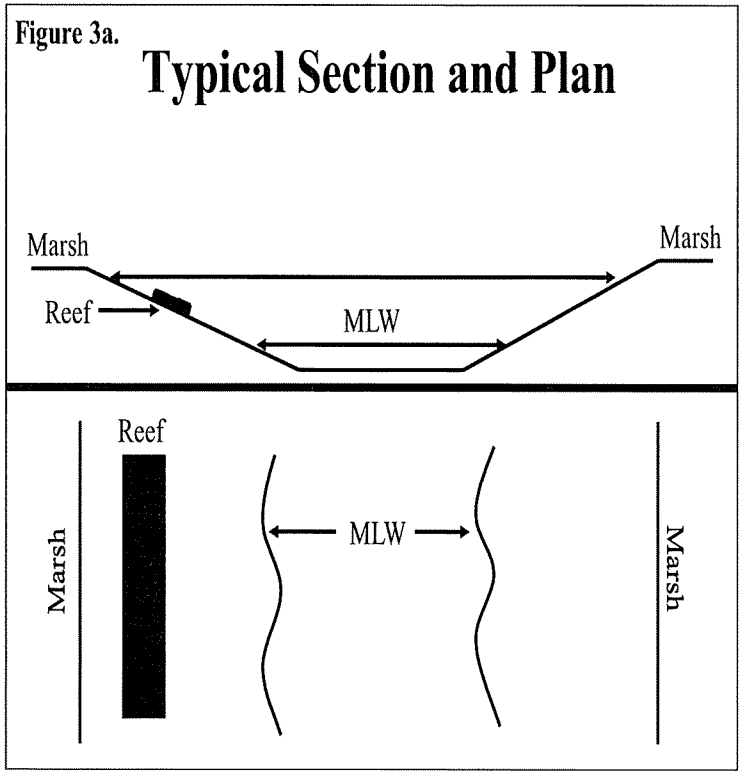
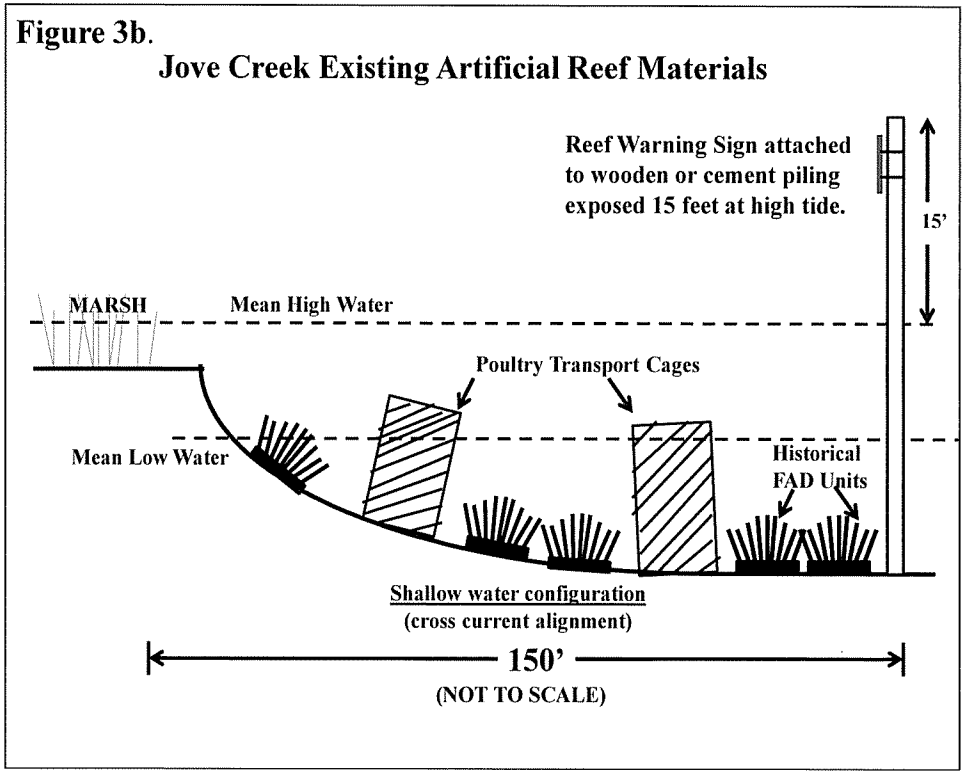


Figure 3b.



APPENDIX XIII- Jove Creek Site

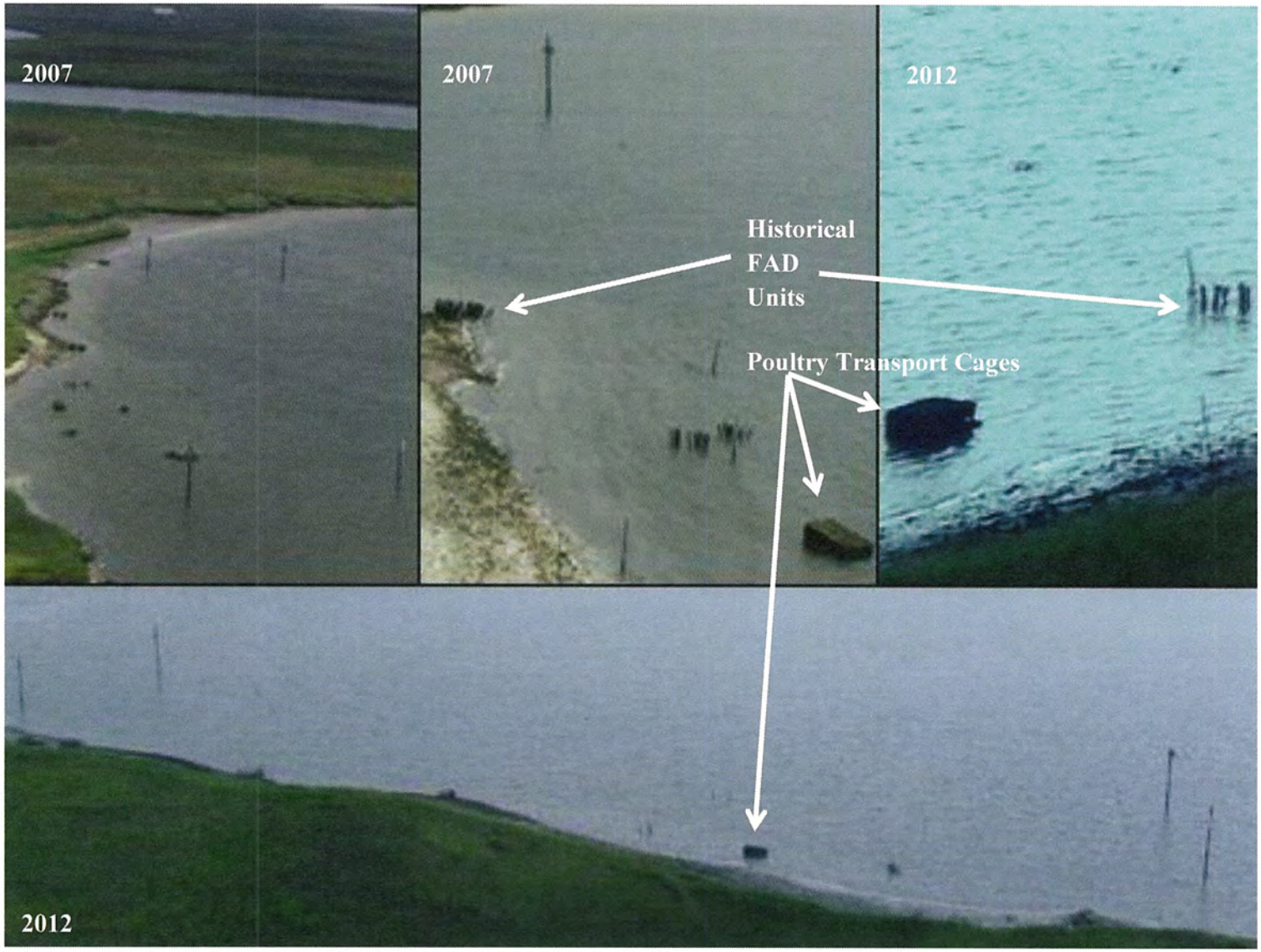


Figure 4. Jove Creek reference photographs from helicopter over-flights: 2007 and 2012.

APPENDIX XIV -Little River Site

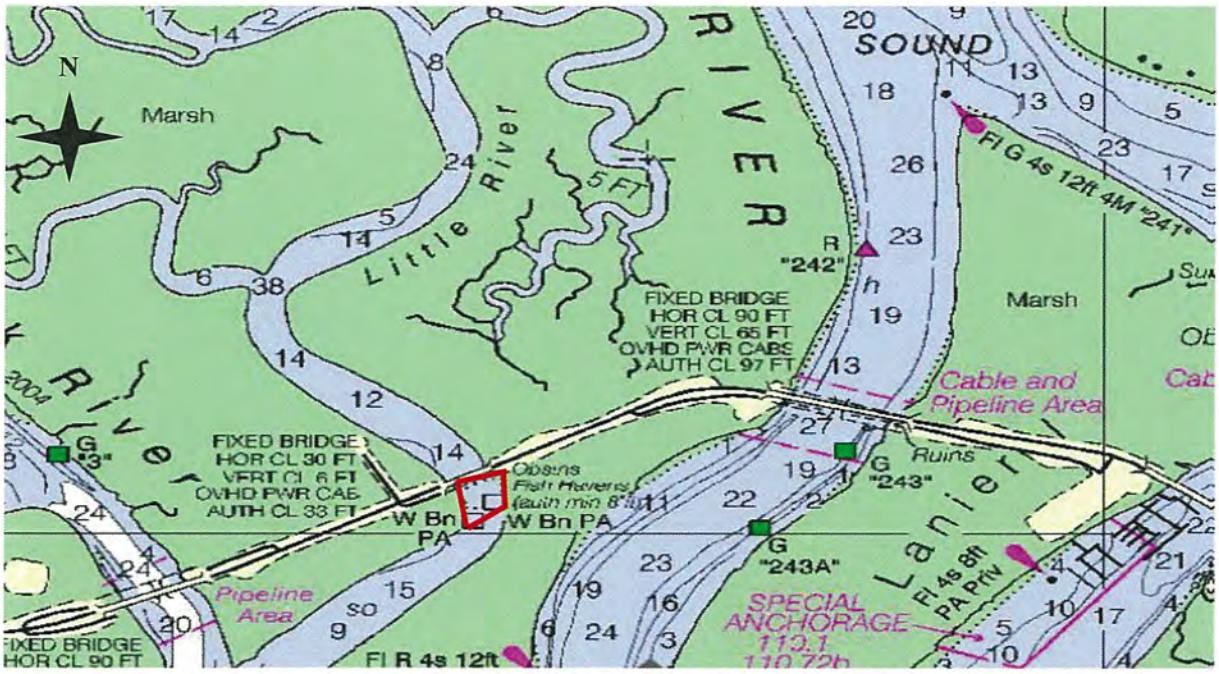


Figure 1. Little River Inshore Artificial Reef Site Shown in Red. Nautical Chart #11506 (NOAA: St. Simons Sound, Brunswick Harbor and Turtle River). *Sites were originally permitted 75' away from the existing bridge in 1984 as cable and pipelines run adjacent to and underneath the current Little River Bridge. Both reefs do not interfere with or impede existing lines.*

Figure 2. Aerial Photograph shown with existing pilings, materials, and footprint (West Bank: 330' x 60', East Bank: 260' x 60'). Pilings outlined in red are for navigational purposes.

APPENDIX XIV-Little River Site

Table 2. Site Name: Little River	Piling Locations: **Latitude & Longitude for Navigational Purposes**	Total Area = West & East Banks Combined	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
West Piling	**31.167550° / -81.436333°**	35,400 Ft^2	0.0 nm	0.01 nm	0.01 nm	0.0 nm	15 Feet	0.04 nm
East Piling	**31.167700° / -81.435817°**	0.81 Acres						

Figure 3a.

Typical Section and Plan

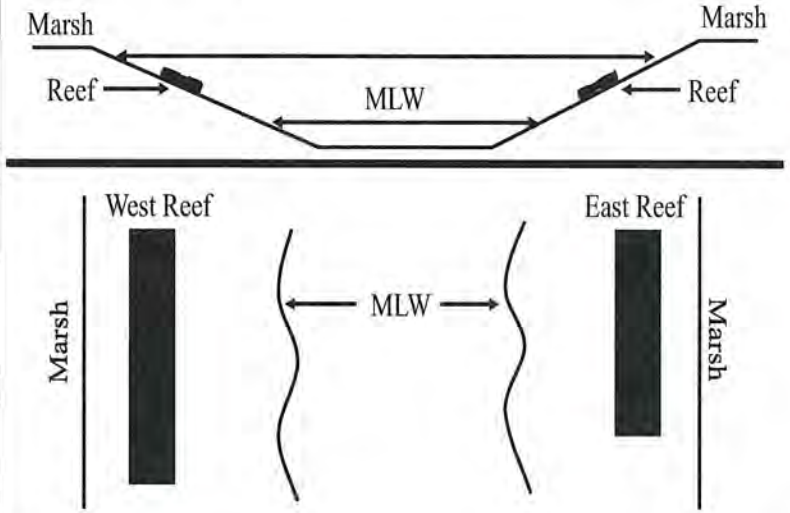
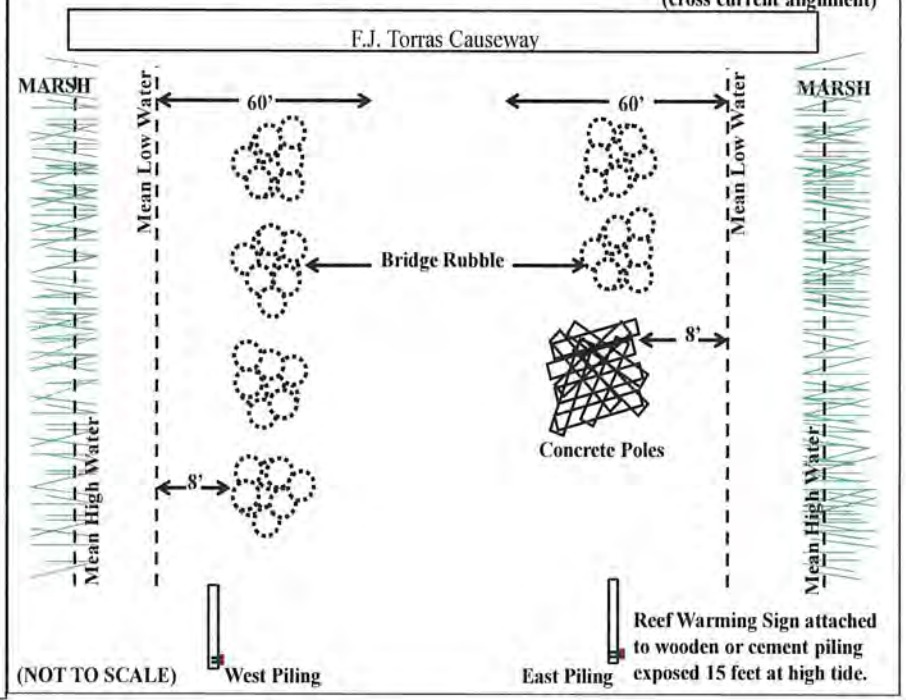


Figure 3b. Little River Existing Artificial Reefs Materials **Shallow water configuration (cross current alignment)**



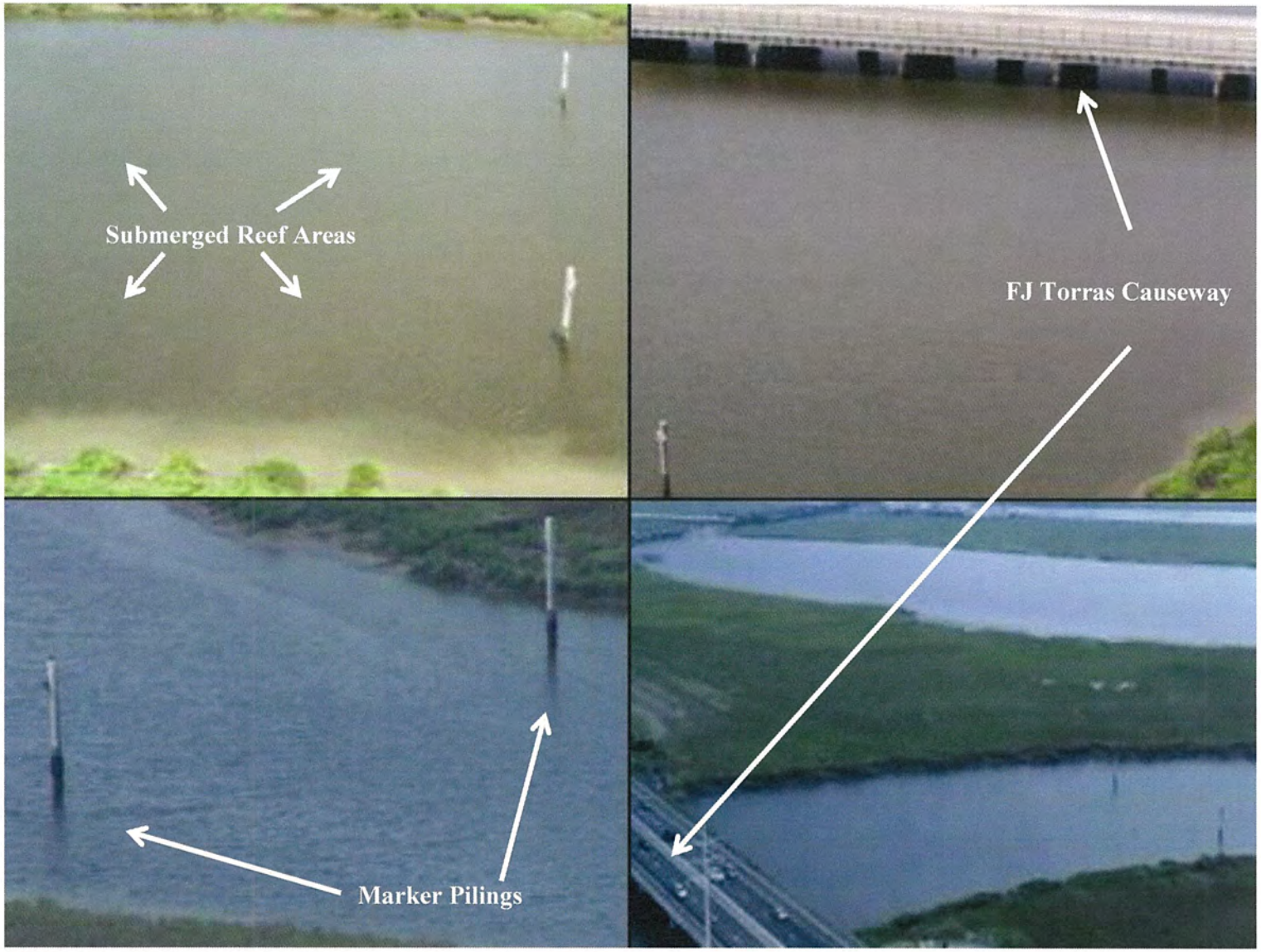


Figure 4. Little River (sub-tidal reef) reference photographs from helicopter over-flights: 2005, 2008, and 2012.

APPENDIX XV-Henry Vassa Cate (Twin Sister's) Site

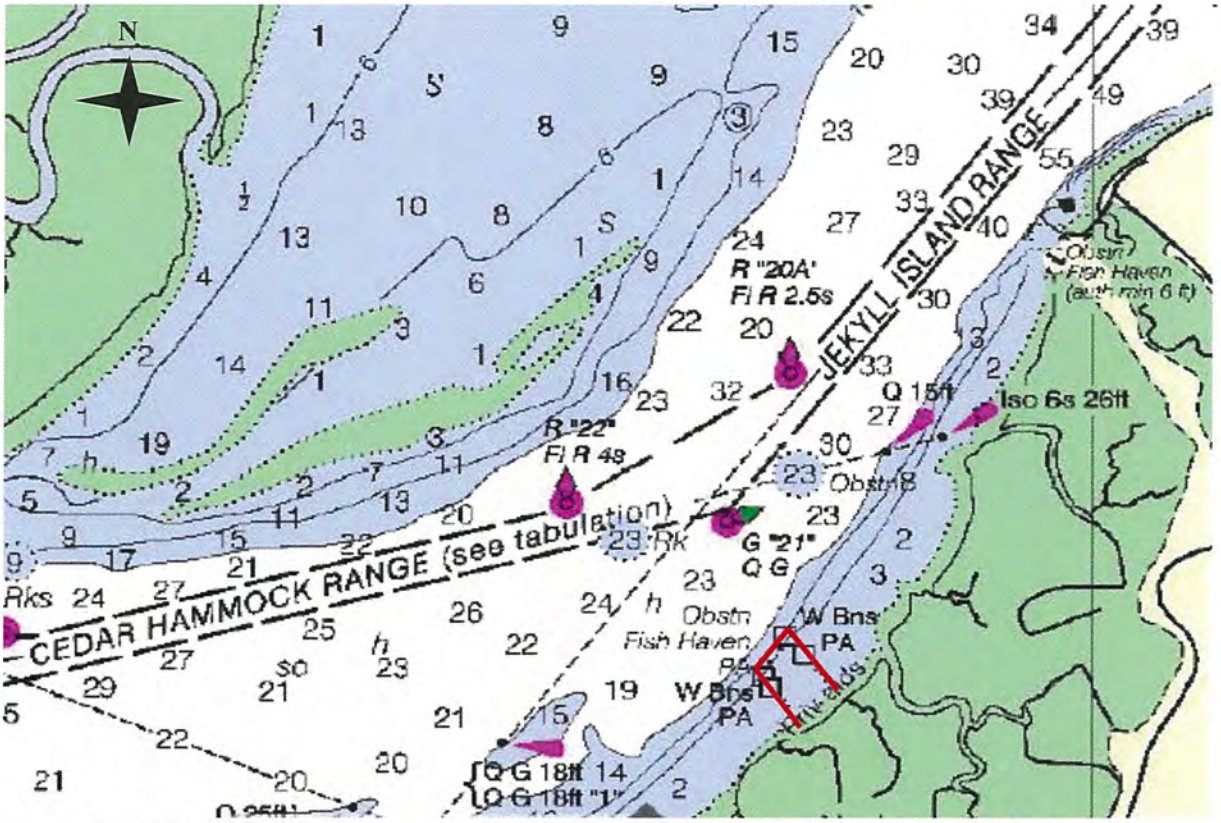


Figure 1. Henry Vassa Cate (Twin Sisters) Inshore Artificial Reef Site Shown in Red Nautical Chart #11506 (NOAA: St. Simons Sound, Brunswick Harbor and Turtle River)

Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (400' x 400'). For navigational purposes the southernmost piling is outlined in red.

APPENDIX XV-Henry Vassa Cate (Twin Sister's) Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name: Henry Vassa Cate (Twin Sisters)	**31.103383° / -81.426667°**	160,000 Ft^2	0.0 nm	0.0 nm	0.20 nm	0.0 nm	23 Feet	1.11 nm
	31.104433° / -81.425900°	3.67 Acres						
	31.104067° / -81.425617°							
	31.103717° / -81.426917°							

Figure 3a.

Typical Section and Plan

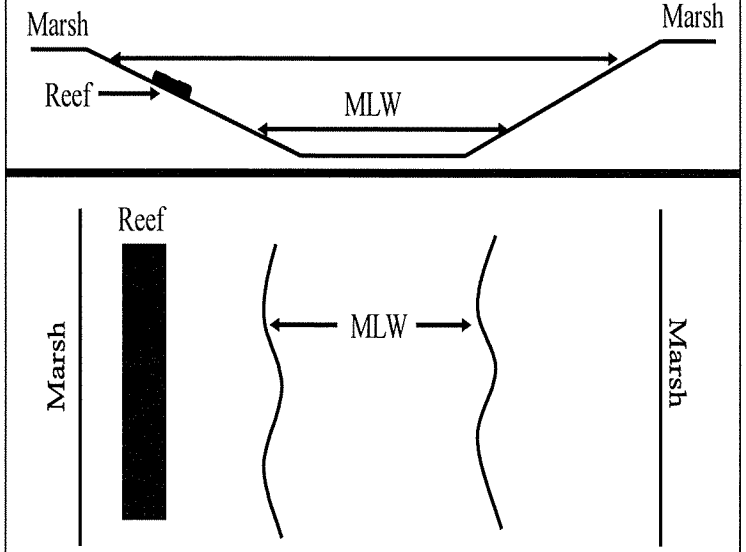
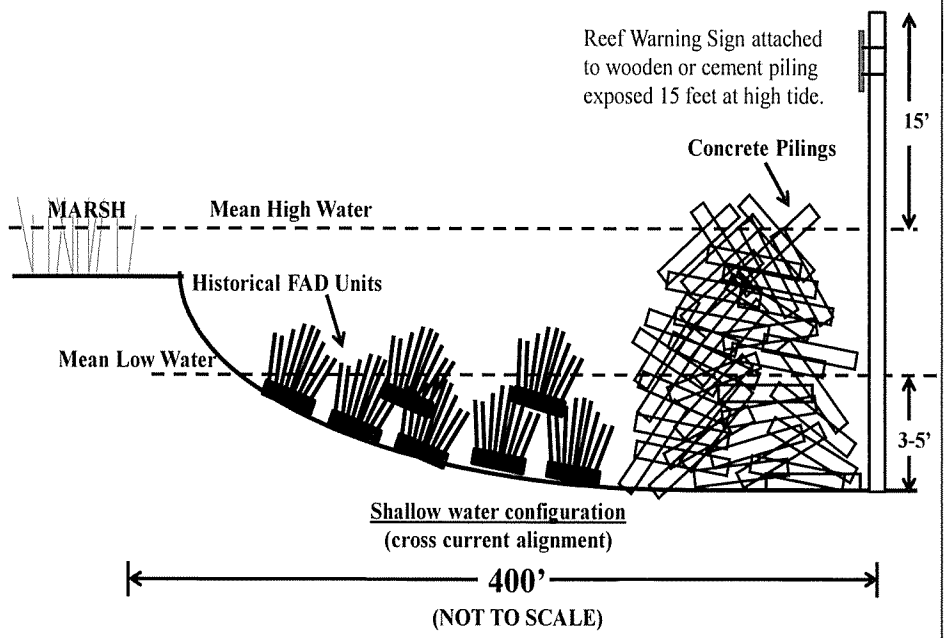


Figure 3b.

Henry Vassa Cate (Twin Sisters) Existing Artificial Reef Materials



APPENDIX XV-Henry Vassa Cate (Twin Sister's) Site

Figure 4a. Henry Vassa Cate (Twin Sister's) reference photographs from helicopter over-flights: 2005-2006.

APPENDIX XV-Henry Vassa Cate (Twin Sister's) Site

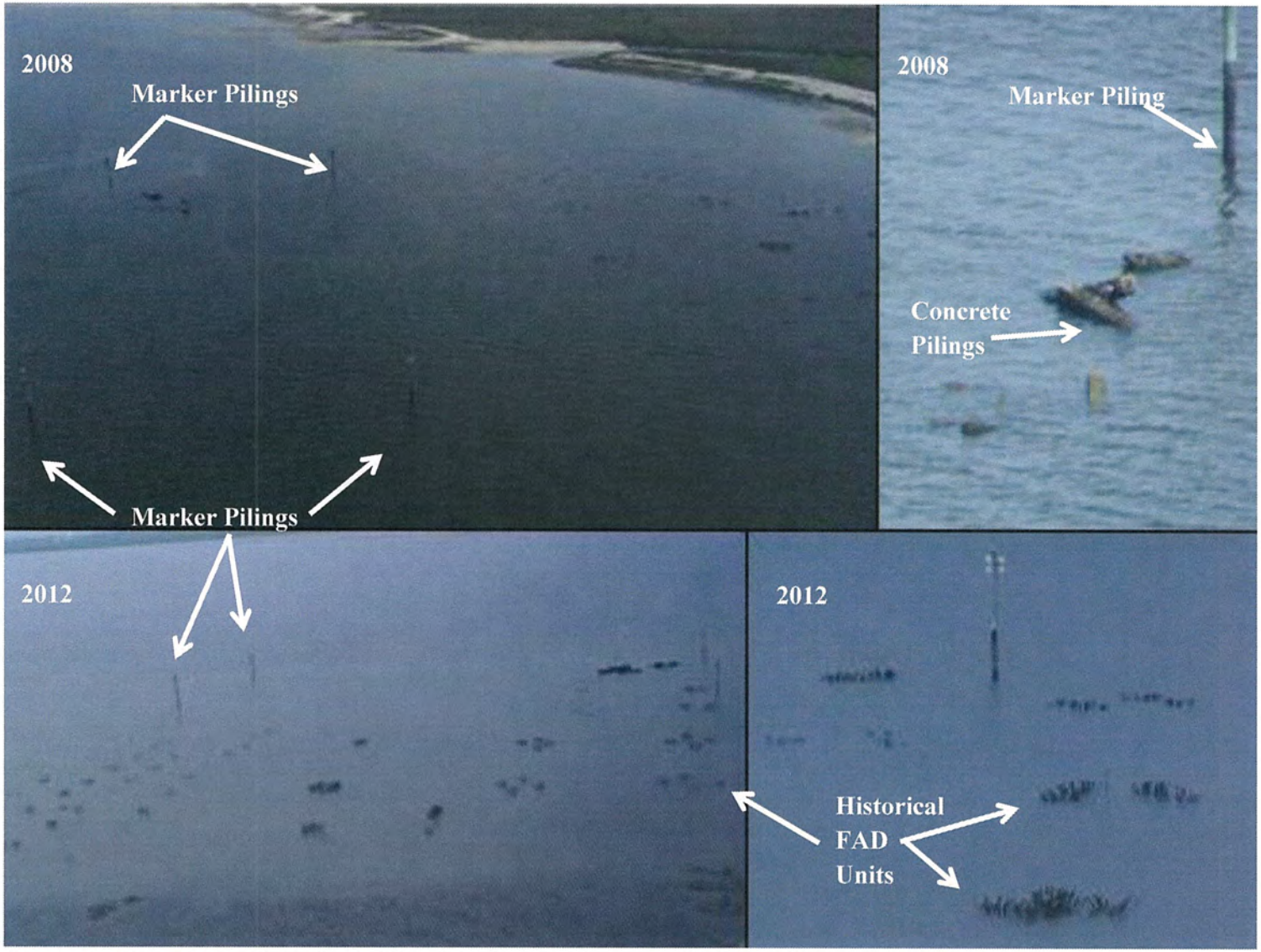


Figure 4b. Henry Vassa Cate (Twin Sister's) reference photographs from helicopter over-flights: 2008 and 2012.

APPENDIX XVI- Mud Creek Site

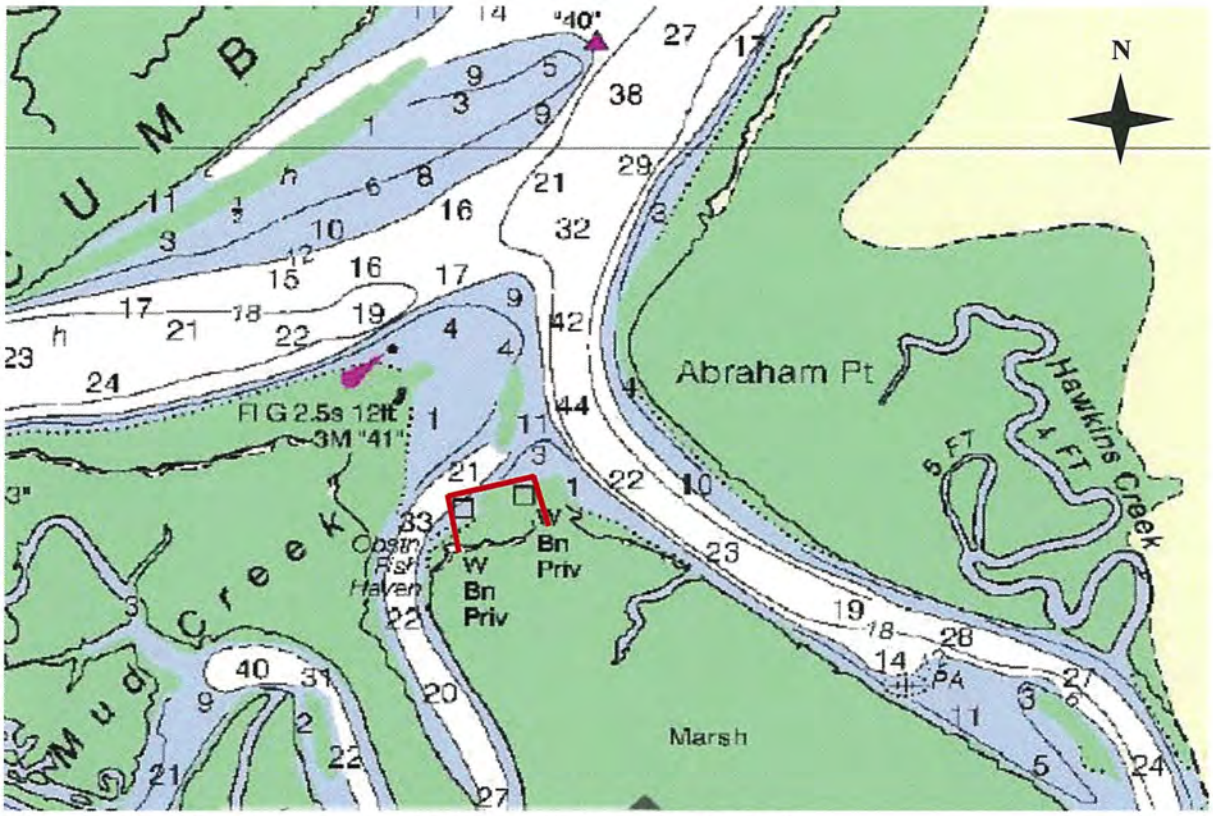


Figure 1. Mud Creek Inshore Artificial Reef Site Shown in Red
Nautical Chart #11504 (NOAA: St. Andrew Sound and Satilla River)

Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (600' x 200'). For navigational purposes the southernmost piling is outlined in red.

APPENDIX XVI- Mud Creek Site

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name:	**30.904667° / -81.469500°**	120,000 Ft^2	0.0 nm	0.04 nm	0.35 nm	0.0 nm	21 Feet	0.1 nm
Mud Creek	30.905667° / -81.468217°	2.75 Acres						

Figure 3a.

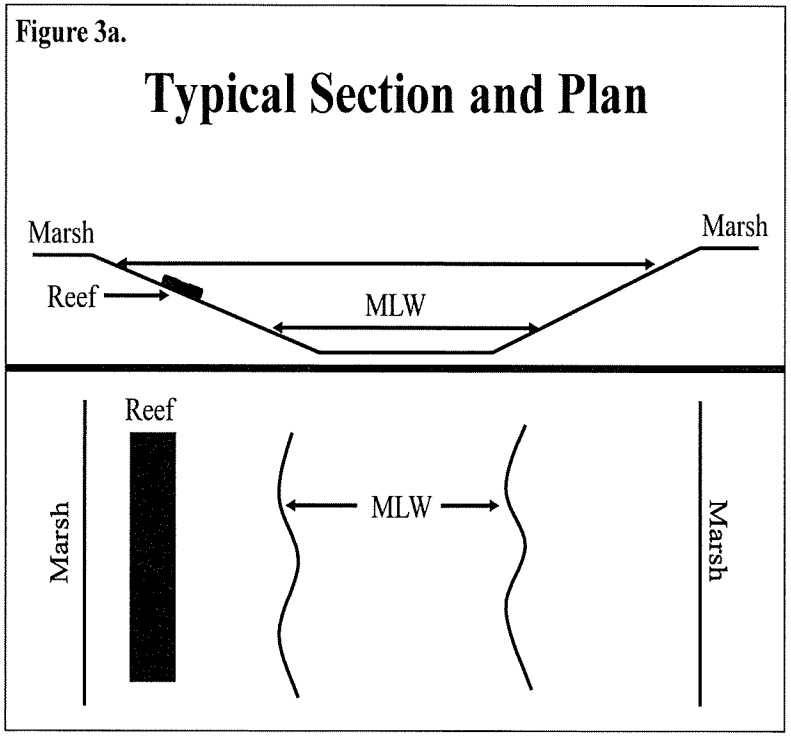
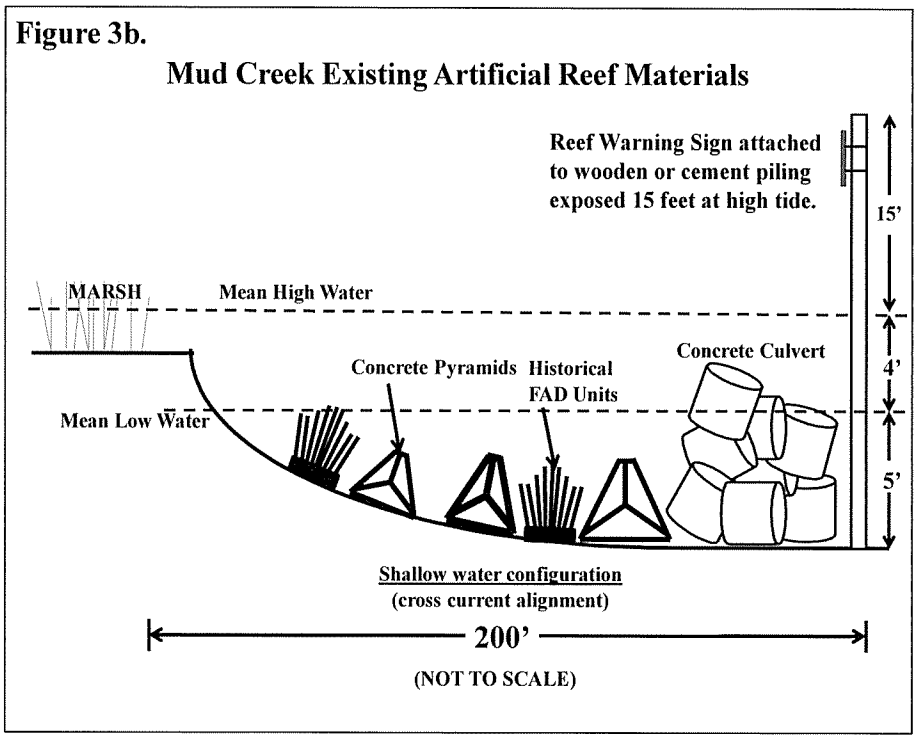


Figure 3b.



APPENDIX XVI- Mud Creek Site

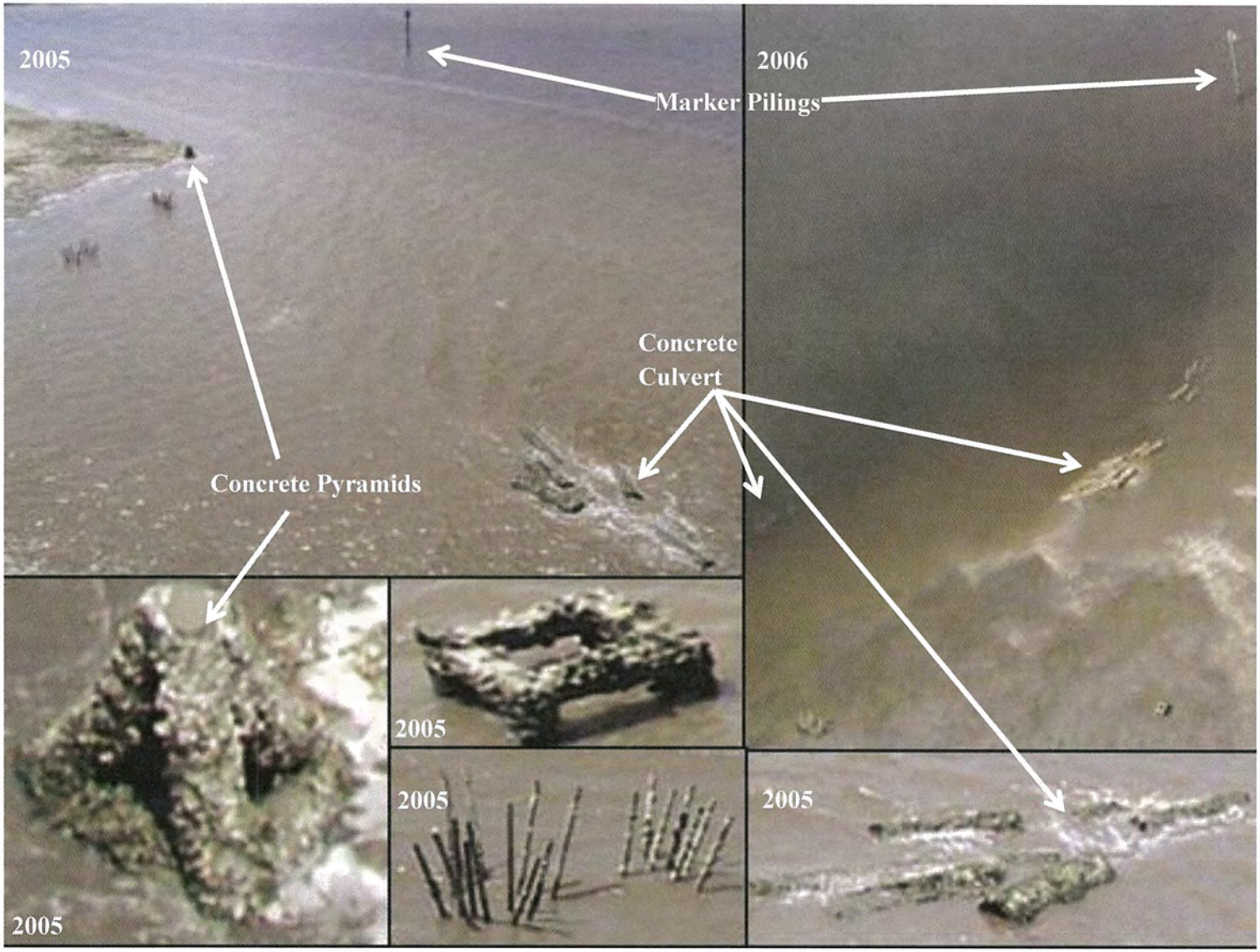


Figure 4a. Mud Creek reference photographs from helicopter over-flights: 2005- 2006.

APPENDIX XVI- Mud Creek Site

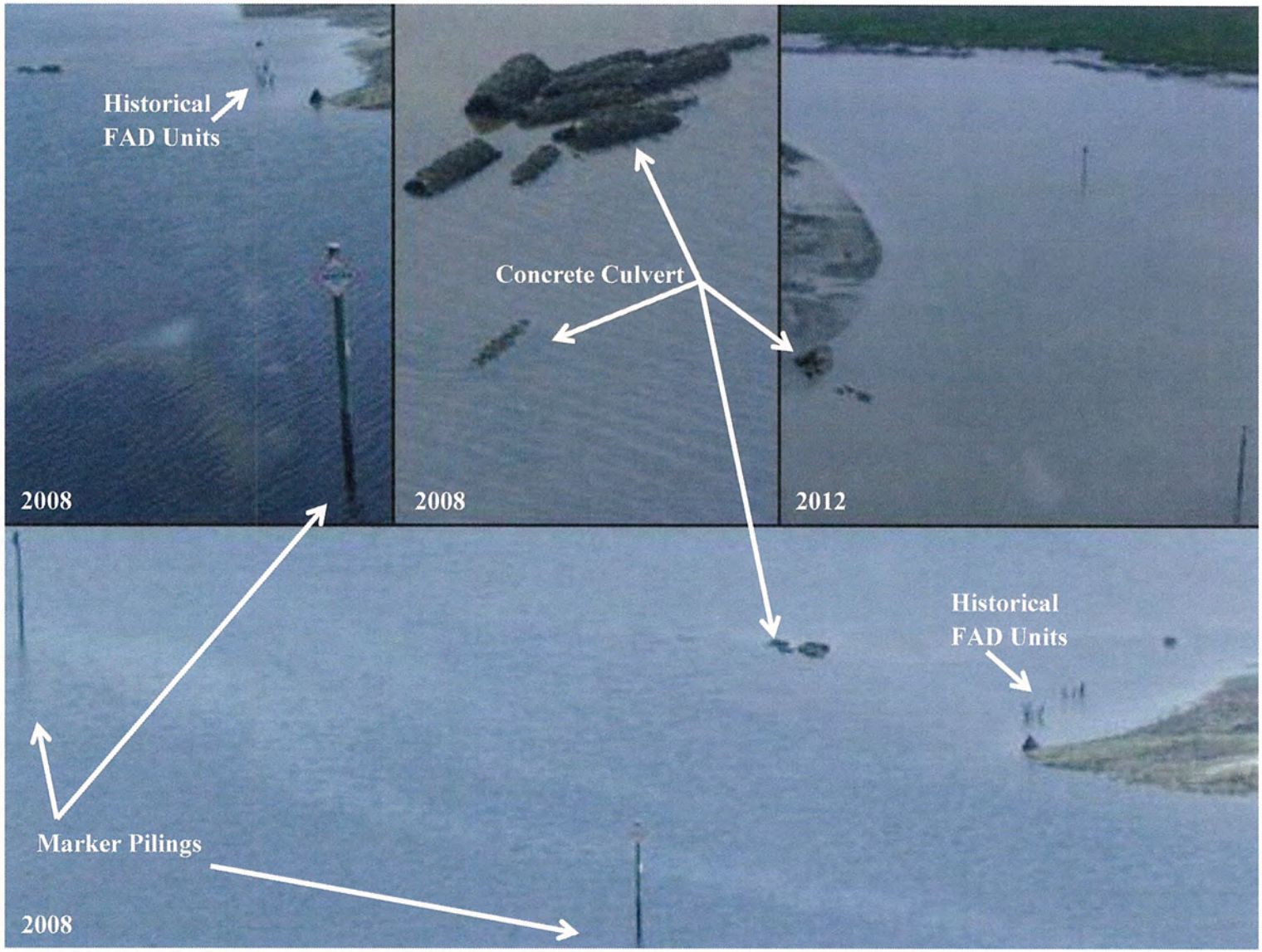


Figure 4b. Mud Creek reference photographs from helicopter over-flights: 2008 and 2012.

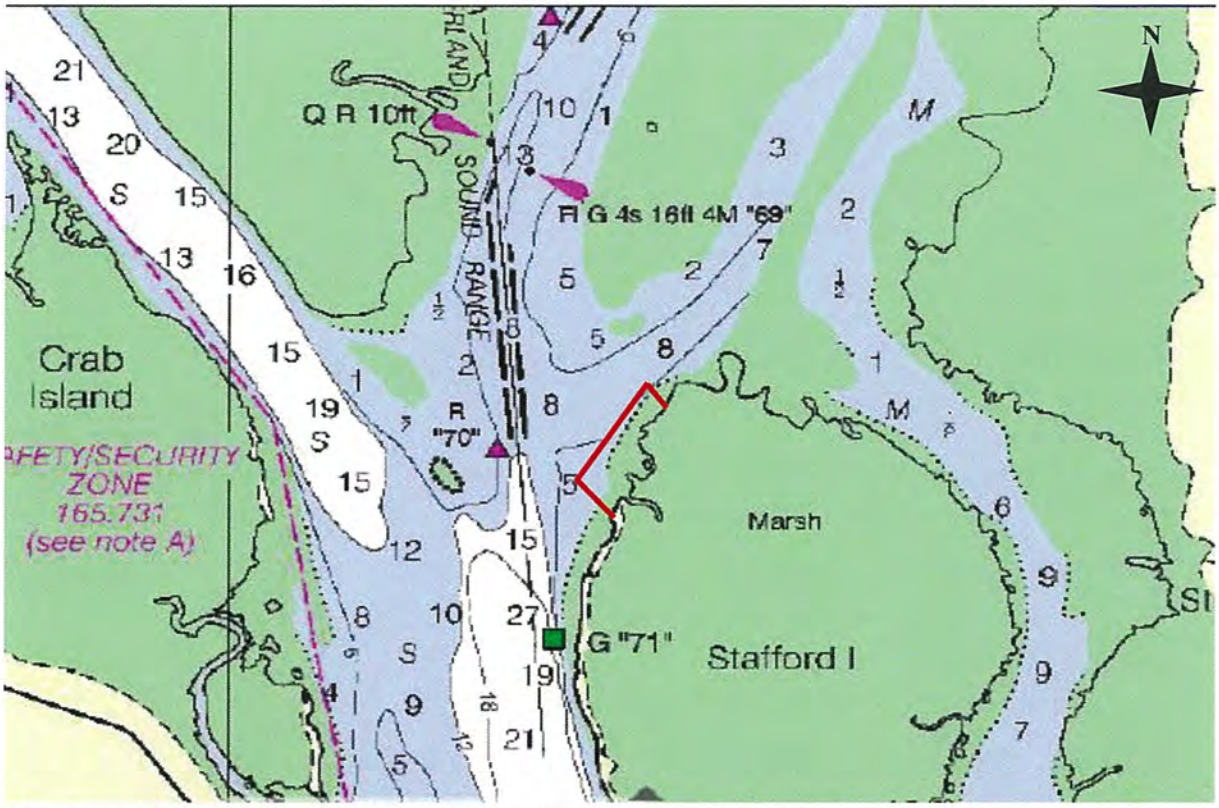


Figure 1. Stafford Island Inshore Artificial Reef Site Shown in Red
Nautical Chart #11504 (NOAA: St. Andrew Sound and Satilla River)

Figure 2. Reef Site Aerial Photograph shown with existing pilings, materials, and footprint (800' x 200'). For navigational purposes the southernmost piling is outlined in red.

APPENDIX XVII- Stafford Island

Table 2.	Piling Locations Latitude & Longitude: **Southernmost Piling used for Navigational Purposes**	Total Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
Site Name: Stafford Island	**30.818917° / -81.488850°**	160,000 Ft^2	0.0 nm	0.0 nm	0.28 nm	0.0 nm	8 Feet	0.3 nm
	30.820833° / -81.487167°	3.67 Acres						

Figure 3a.

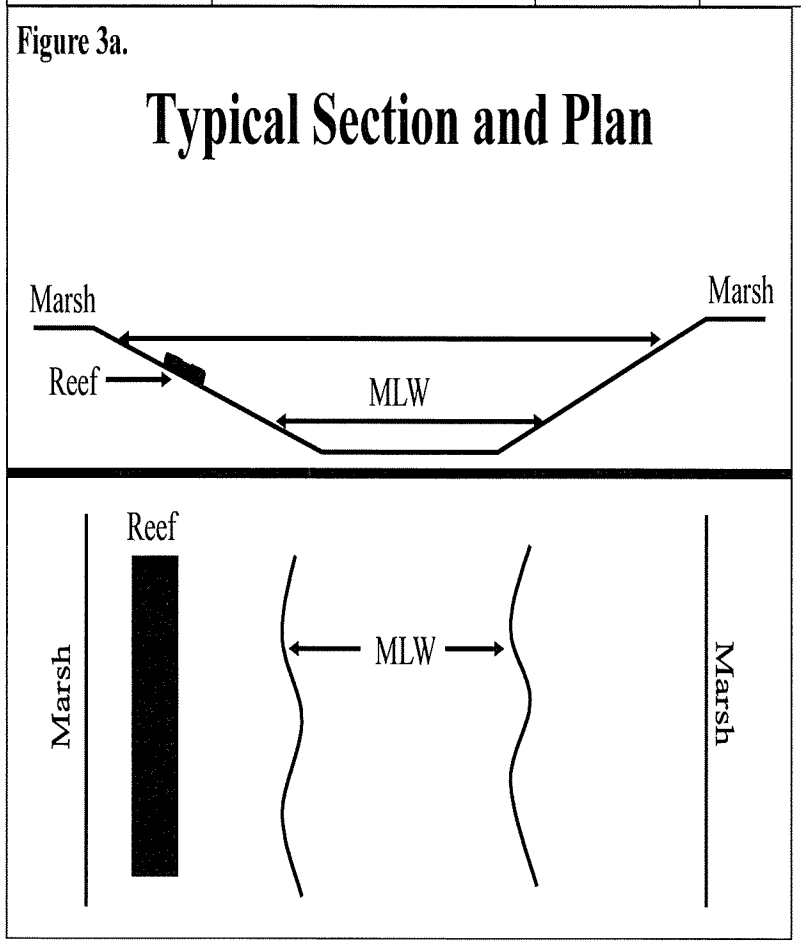
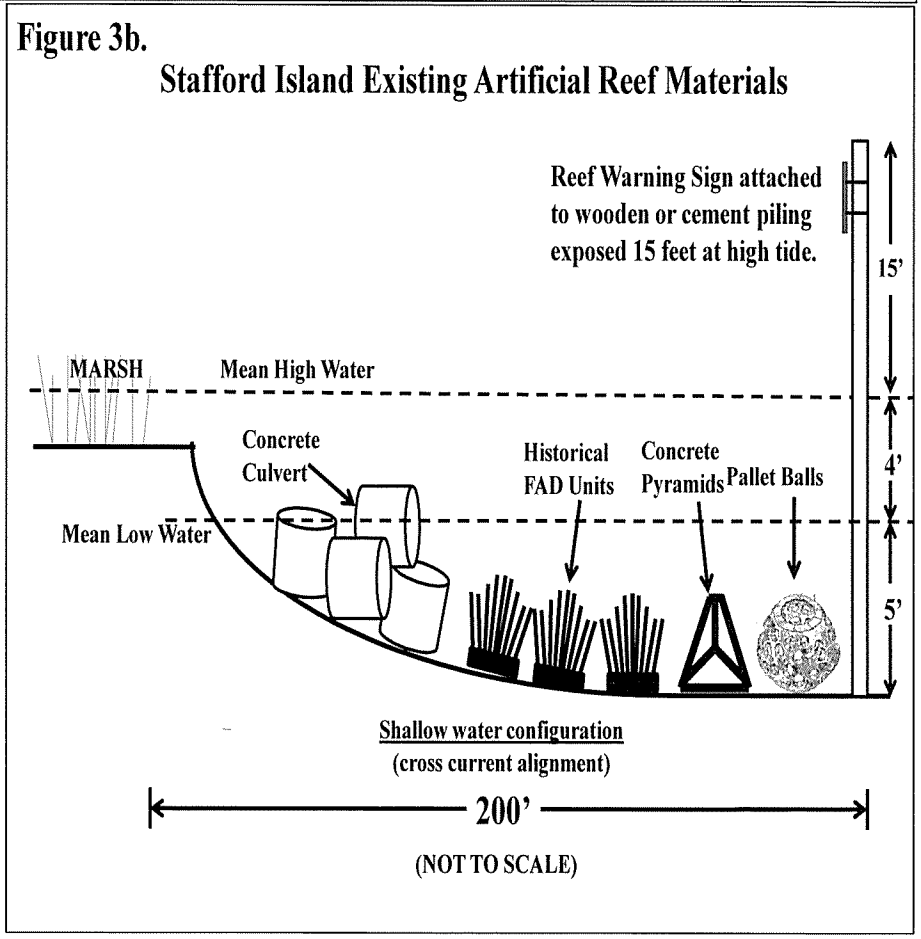


Figure 3b.



APPENDIX XVII- Stafford Island

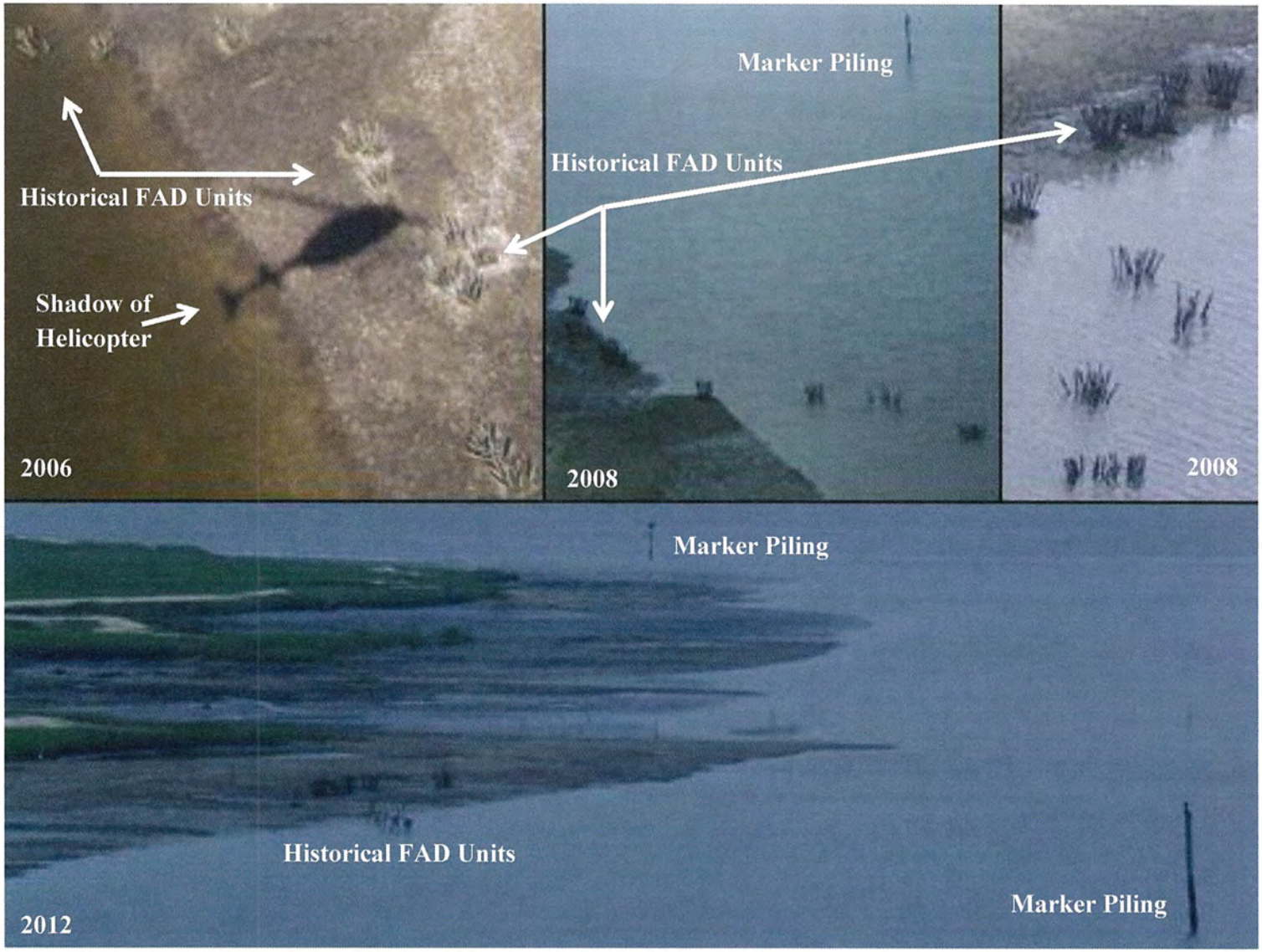


Figure 4. Stafford Island reference photographs from helicopter over-flights: 2006, 2008, and 2012.

APPENDIX XVIII- Jekyll Island Pier Site

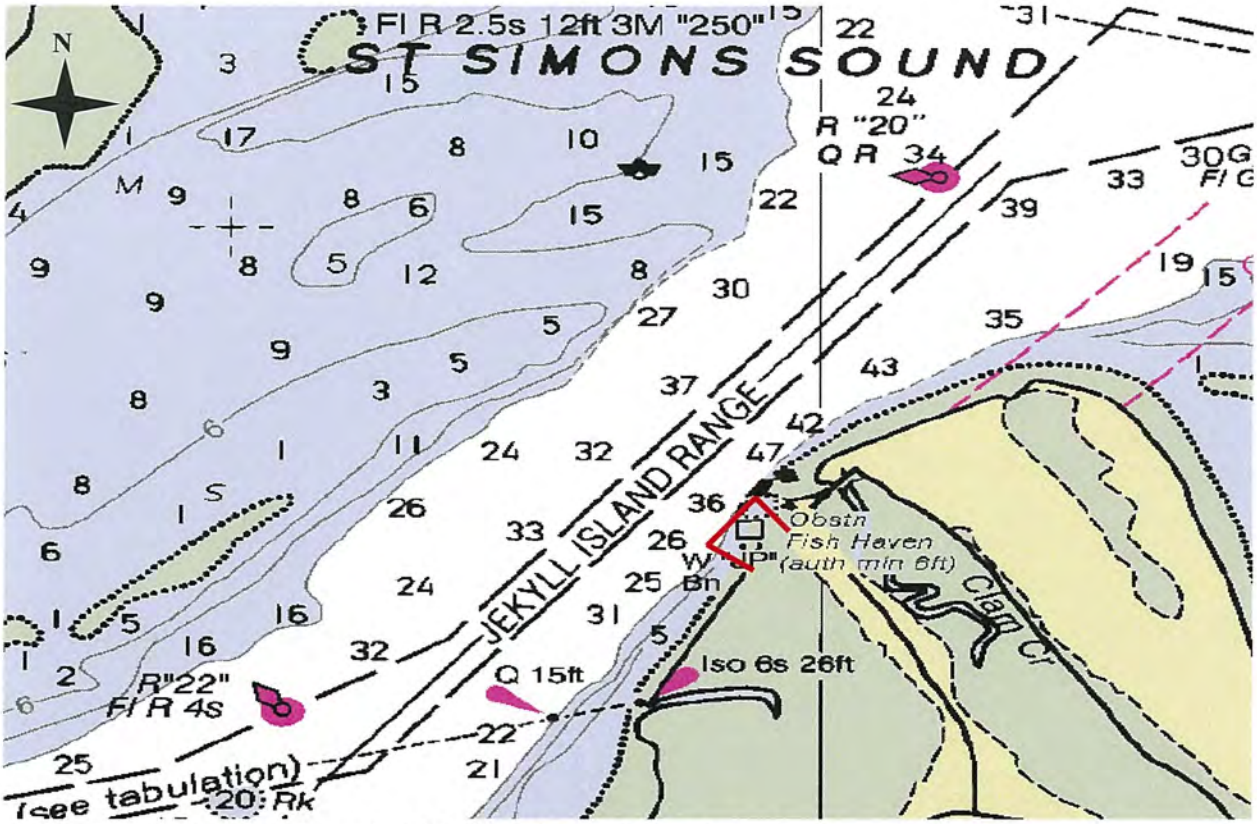


Figure 1. Jekyll Pier Inshore Artificial Reef Site Shown in Red
Nautical Chart #11506 (NOAA: St Simons Sound, Brunswick Harbor, & Turtle River)

Figure 2. Aerial Photograph of the Jekyll Pier Inshore Artificial Reef Site. Existing materials/footprint (175' x 150') on the west arm of the pier and footprint (175' x 150') for the east arm of the pier.

APPENDIX XVIII- Jekyll Island Pier Site

Table 2. Site Name: Jekyll Island Pier	General Locations: Latitude & Longitude **(No Pilings Exists)**	Area	Total Combined Area	Total Area Over Vegetated Marshlands	Distance of Project into waterway at MLW	Distance of Project from Navigable Channel	Distance to next structure to either side of proposed project	Depth of Waterway at MLW	Total Width of Waterway from MLW to MLW
West Pier Arm	31.116696° / -81.418431°	23,158 Ft^2	47,885 Ft^2	0.0 nm	0.05 nm	0.1 nm	0.0 nm	5.0 ft	1.36 nm
East Pier Arm	31.117506° / -81.417463°	24,727 Ft^2	1.1 Acres	0.0 nm	0.05 nm	0.1 nm	0.0 nm	5.0 ft	1.36 nm

Figure 3a.

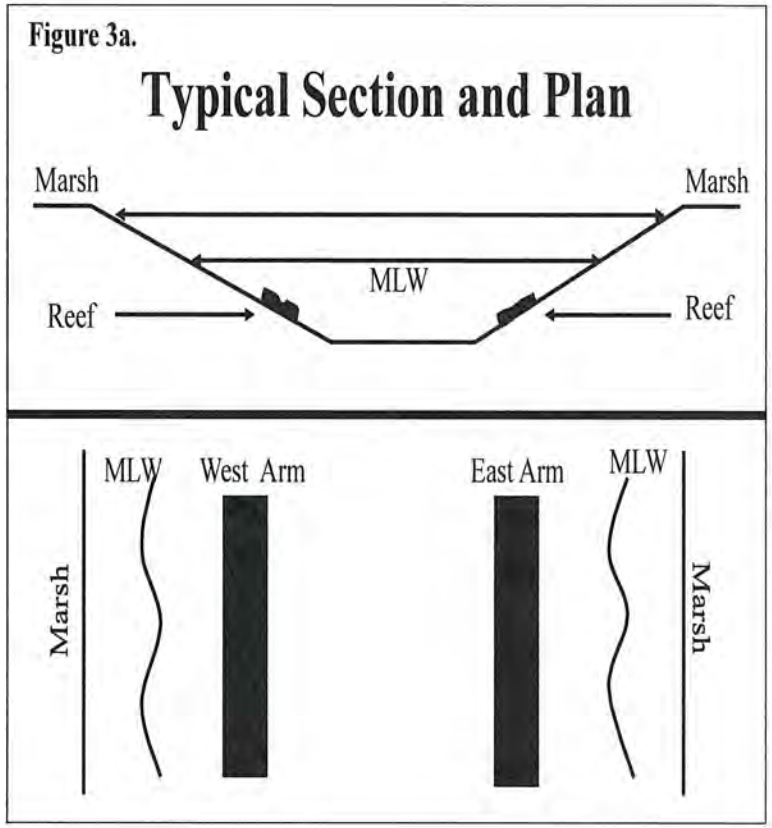


Figure 3b. Jekyll Pier west arm contains artificial reef materials while east arm does not.