The Explorers Club
Flag Report

HMS Surprise
Initial deep diving survey and imagery of intact 1800’s-era sailing vessel

Geographic Region: Dry Tortugas, Florida

Country/Countries of Destination: USA

Ultimate Destination: 19th century ship wreck of unknown sailing vessel

Approximate boundaries: Classified
Description: The wreck lies in a soft silt bed at approximately 220/fsw, in U.S. territorial waters. Future goals, with the information gathered from this expedition, are to develop a 10-year summer excavation plan partnering with one or more major universities and/or museums.

Purpose/Objectives: Captain Tim Taylor was the first person to dive this wreck in October of 2004, at the behest of a local fisherman who had drug up a piece of copper sheeting (part of the hull) while trawling and shared his find with a salvage company. The salvagers completed a week of initial side scan sonar imagery on the site and wanted a video survey. After a solo bounce dive to 220 feet on air, Tim recorded enough video and retrieved a small brass port which allowed them to arrest and claim the site with the admiralty court. R/V Tiburon, Inc. returned with mixed gas and rebreathers in December 2005 for a quick video survey that led to the belief that the vessel is from the early to mid 1800’s era. Deemed of no commercial value by the salvage company, the site was donated to our non-profit Ocean Outreach Inc. so that we could carry out a long-term archeological project with a national university and/or museum. Our first step in this long-range project was to photo document the site with the intention of having Dr. John Broadwater assess its historical significance. This initial information would allow us to seek funding and form strategic partnerships for a long-term project. All indications are that we have found an intact time capsule in diving range that provides a rare opportunity for exploration. We plan to model this after terrestrial academic archeological programs and engage graduate and post graduate students in working the site every summer season. The winter months will be spent preserving, cataloging, researching, and planning the next year’s project. The end results could be an underwater archeological site at 200 plus feet deep that is fully excavated, documented, and displayed.

Itinerary and routing (locations, transportation, and subsistence arrangements): The entire operation was run from the Research Vessel Tiburon (R/V Tiburon) based out of Key West, Florida. Owned and operated by Tim Taylor, FN04, the vessel is 63 feet long and equipped to sleep 14, plus 5 crew. She is a USCG certified and SOLAS-rated vessel which specializes in research and outreach projects.

Departure Date: May 30, 2006

Return Date: June 05, 2006

Departing Key West, the Tiburon made way to the anchorage of the Dry Tortugas National Park. We based operations from this location and motored each morning to the wreck site.
Challenges:

Depth and location - the wreck lies in 220/ftsw and requires technical divers doing staged decompression diving with limited bottom time and restrictive repetitive diving sequences. This limited the dive teams to 1 dive per day and a range of bottom times from 20-40 minutes, with a run time of just over an hour to about three hours, respectively.

Archeological integrity - with a strong desire not to disrupt the site and provide the highest level of integrity to the process for historical purposes, some of the possible methods of wreck identification – which include removal of artifacts, scraping, digging into the site - were off limits. High definition video was deployed to provide subject matter experts and divers the experience of seeing the wreck from topside and remote locations to assist in identifying key factors of the site without disrupting current conditions.

Limited resources - With a small team of four working divers, there was a limited amount of time available to accomplish work each dive day.

Accomplishments:

9 dives of two-diver teams to a depth of 200+ feet over the course of six days for a total diving time of 34 hours, 36 minutes; bottom time total of 7 hours, 48 minutes

Daily breakdown as follows:

May 29, 2006  day 1 diving: 1 dive of two divers for 97 min each  
May 30, 2006  day 2 diving: 2 dives of two divers each for a total of 171mins. (79 and 92 each, respectively)  
May 31, 2006  day 3 diving: 2 dives of two divers for a total of 246 min (176 and 70 each, respectively)  
June 1, 2006  day 4 diving: 1 dive of two divers for 172 min each  
June 2, 2006  day 5 diving: 1 dive of two divers for 154 min each  
June 3, 2006  day 6 diving: final dive day; 2 dives of two divers each for a total of 198 min (77 and 121 each, respectively)
Initial analysis of footage by Captain Hare and the dive team contributed to the following preliminary assessment of the wreck site:

Although the desired goal of identifying the wreck was not accomplished, we were able to broadly document the primary hull structure and debris fields. We also came to some first conclusions which will need to be verified, narrowing down the likely period of building into the late 19th century, possibly 1880s-1890s. This somewhat contradicts the previous 2004 expedition results in which the dating of artifacts, including glass bottles, seemed to indicate a potential mid-19th century (1850s-1870s) period, based on the bottle manufacturing processes used. Further study by additional experts of the site and artifacts will hopefully provide more conclusive dating of the wreck. The successful collection of video footage provided the raw resources to create a video mosaic which thus enables the production of a detailed visual map for future reference. Sketches of the primary hull structure enabled a broader visual overview of the decking and locations of specific attributes of the wreck site. The overall video production of the expedition both topside and below should prove a valuable asset for further evaluating processes and accomplishments.

The likelihood of properly identifying the correct bow and stern orientations, (which was previously not clear based upon the position of the rudder on the wreck site), seems to have been clarified to indicate the bow is to the west and the stern to the east. This is still to be finalized.

Clear identification was established for the “rear” mast (approximately 3 feet in diameter) at 20’ from the stern, with a possible rake to the stern of maybe 15 degrees. Some divers felt they saw the rake clearly, while others were not as certain.
Aft and forward of the exposed wreck site are indications of a cargo of hardwoods; a sample was retrieved for further analysis. There were a large number of bronze pins that were used to build the upper hull structure, which has since deteriorated. In addition, an abundance of bronze plates with pins were identified as the pieces that held the upper decks in place.

Mid-ship is covered with shrimp boat nets and long-line gear, making it impossible to currently identify the position of the center mast, but it would appear to be mid-ship at approximately the 50’ mark of the 111’ length of the hull section. The beam runs just under 30’ at the center of the wreck site.

The rudder components, three specific parts all oriented on or near the bow section of the wreck, should yield additional information that may help to further narrow down the period of shipbuilding. The largest rudder component lies in the sands on the starboard side of the wreck and still has intact wood parts that made up the rudder assembly.

Along the starboard side of the wreck is a large metal tube that is surmised to have been around the mast. The length is undetermined as it is buried into the sand. It is approximately 2-3’ in diameter and is the home to an especially large black grouper.

The recovery of a bottle (champagne) may provide additional details in respect to the dating of the wreck and will be forwarded to a bottle expert for analysis of the period of the bottle’s manufacture.

Initial survey of the debris fields off the main hull indicate there is little-to-no debris in the northeast quadrant of the wreck site; there is a small collection of rigging components and copper sheeting in the sands to the north by northeast area of the debris fields; more significant debris in the east and southeast sections of the site. The southwest quadrant of the site remains largely uninvestigated; however, the previous visit had identified a portion of the port running light just off the southern side of the wreck site and there may be additional debris worth review.

Sand sweeps were made about 100-150’ out from the primary wreck site, but due to the cursory nature of this effort, provided little information. Objects are well buried in the sand and silt and there is minimal visibility, ranging from 10-20’, due to the fine silt bottom. Objects identified in the debris fields are many metal “horse collar” pieces that would be used to manage the sails on the masts and boom arms. In addition, 4-6’ poles (likely iron) also used to manage the sails of the ship were found in a concentration in the easterly and southeasterly areas.

The general consensus of the on-board subject matter experts indicate this is likely to be a barge or barq of the late 19th century, possibly of American or Caribbean shipbuilders. Previous assumptions were that it might be of European origin; however, this seems less likely based upon the potential later dating for the ship. Authoritative conclusions await further analysis and study. [artifact pictures]
Successful deployment of safe, deep-wreck diving procedures and processes by a small, efficient team:
The entire team came from varied backgrounds and disciplines. Of immense value was Captain Dave Hare, who provided extensive knowledge and history on maritime practices and ship building history. Dave’s ability to provide insight into potential artifacts and ship building timelines enabled us to fully utilize the HD video footage that was shot each day and provided the team with a detailed accounting of the things we were seeing and recording. It allowed us to create a detailed plan for the following day’s diving, as well as further focus on questions posed during the reviewing of the footage. The structured video review by the subject matter experts provided the dive team with focused objectives and assisted the team in narrowing down the tasks for each day’s diving. Basic operational processes were tested and will be optimized for future expeditions, including the staffing of functions and capabilities required to accomplish the goals of the expedition.

Successful implementation of video in situ, with podcast production concept also initially executed. Over 40 hours of high quality video footage was captured.
Crew Logs/Observations

Daily Dive Operations -
All deep exploration and shallow support diving requirements for Trimix, Heliair, EANx, Sofnolime scrubber, and air were provided by R/V Tiburon, Inc. One rigid, inflatable boat (RIB) along with surface support of RIB pilot, safety diver, and videographer (when required) provided support for each dive. Support aboard the Tiburon included boat captain, diving safety officer, lookout, videographer, and stand-by safety diver.

Diving equipment consisted of Inspiration rebreathers (CCR), Twin 100 and 95-cubic foot tanks open circuit (OC) SCUBA, travel gas tanks, decompression tanks, bailout tanks of 80, 63, and 40 cubic feet, regulators, diving gauges and computers, as well as laptop computers with decompression and gas blending software, and many other items provided by individual team members or out of ship’s store. Safety divers used 80 and 63 cubic ft. tanks with standard SCUBA configuration.

Breathing gas selections for deep diving were as follows:
CCR- Heliair 10% oxygen/50% helium (10/50) used on set point of 0.7 and 1.3 with bailout tanks of 14/33 and 50/50 in 40 cubic ft. aluminum tanks carried by each diver

OC - twin steel tanks of 100 and 95 cubic ft. were used. Each diver carried as well one 80 cubic ft. aluminum tank with 32% oxygen for a travel mix and one 40 cubic ft. tank with 100% oxygen for decompression. The final mission dive was conducted with a 63 cubic ft. aluminum tank in place of the larger 80 cubic ft. travel gas tanks.

Each team conducted one dive per day. CCR run times were 123 to 180 minutes; OC run times were 68 to 76 minutes. Average bottom times of 30-40 minutes for CCR and 20-22 minutes for OC were planned and executed.

Safety divers primarily used 21% NITROX (air), with an EAN25 used on one day. Additional emergency decompression of 60% was available from RIB/safety diver. Estimated total gas used during the Expedition dives were 650 cubic ft. of oxygen and 700 cubic ft. of helium.
**Captain David Hare**

David holds a 3,000-ton Oceans Masters license, commercial jet pilot’s license, and is a SCUBA diver and businessman. With two circumnavigations under sail and over 125,000 ocean miles, David has a substantial background in worldwide sailing exploration. Currently David is the Captain of a Delta expedition yacht – *Thunder* - based in Fort Lauderdale. As the son and grandson of wooden sailing boat builders, David has had a life long passion for the sea and especially for 19th century Baltimore Clippers. As the previous Master of sailing vessel LYNX, (an 1812 privateer replica designed by Melbourne Smith), Hare was excited to join the expedition as the co-captain in search of a here-to-for unexplored sailing wreck. His in-depth knowledge of shipbuilding brought an added dimension of expertise to the project.

Having two captains on board also allowed Captain Taylor the opportunity to dive on the wreck without worrying about onboard ship activities. Captain Hare’s responsibilities consisted of getting the Tiburon to and from the dive site and ensuring that a ‘watch person’ was consistently monitoring the divers throughout their two-three hours of decompression stops. During this time, the vessel slowly circled the divers as they floated underwater with the current.

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**Doug Rice, CC rebreather diver**

The wreck:
Returning to the site 18 months after our initial dives to “discover” the wreck was a great luxury. To have reviewed seeing the site in one’s mind for months leading into years – the “magic” came into play when the artists’ renditions combined with our video transects and footage to confirm the “vision” I had built in my mind’s eye from the pervious dives. In my mind, I had imagined a great history for this vessel; she was cruising the open seas for months at a time, making the transatlantic passage between Europe and the Americas, and moving with the winds through history over the great international trade routes. So it may be … but it seems more likely she was a hard working, robustly built barge that moved lumber and materials from place to place, perhaps in long hauls - perhaps in short runs, but maybe not quite as glamorous a history as I had fantasized. Despite the small let-down, it was an outstanding experience to dive a virgin wreck in deep waters, piecing the parts of an archeological puzzle together to uncover the story of a vessel lost at sea.
The dives:
Undertaking long deep dives is as exciting as it is challenging; the “40 minute” dive exacts a harsh penalty of a long decompression. It takes about 4 minutes to get down to the 220’ depth, thus leaving us 36 minutes of bottom time exploring the wreck site. The journey back to the surface from the bottom begins with the first decompression stop at about 150 feet. One hangs on the down line, trying to embed each image and impression of the dive into one’s mind. Then you check-in with your dive partner, making sure all systems are “go” for the long ascent to the surface.

The process continues with stops along the way, each getting progressively longer until you reach the final 20-foot stop. At around 50 feet, we are greeted by the safety diver and the comfort of knowing we are back in the realm where everyone else is. Shortly after dropping off some of our gear with the safety diver, we prepare to leave the down line and do a drifting decompression, where the boat will follow us as the currents move us through the blue water. As we drift along, we continue to maintain our depth to assure a safe and clean decompression. It has taken over an hour and a half to get to that 20-foot stop, so close to the surface, the warmth of the sun and the comfort of your bunk for a nice long nap. Thankfully, the water temperature has warmed from the slightly cooler 71 degrees on the bottom to a balmy 81 degrees as you reach the last stop. Despite the water temperature rising as you ascend, your core body temperature has begun to drop and you feel the chill through your bones during your final decompression stop.

The 20-foot stop lasts for almost 70 minutes, a period where you just hang in the blue, drifting under your lift bag. At times, we got really lucky … when we were joined by a small pod of six dolphins playing in the afternoon sun, or a small Silky shark which would often come to visit us for a while as we floated through his neighborhood of the ocean. Other times, we would simply see nothing but blue and the small little creatures that make up so much of the ocean’s mass. I entertain myself by watching minute colonies of plankton and jellyfish floating through the water column, imagining for this little jellyfish that his journey really is a lifetime, where mine only has to last another 70 minutes until I break through the ocean surface and feel the warmth of the sun again.

Flag Applicants:

John D. Broadwater, PhD
NOAA, Monitor National Marine Sanctuary
Chief Scientist, Monitor Expedition 2002
Manager, Monitor National Marine Sanctuary

John Broadwater is the Chief Scientist of the Monitor Expedition 2002. He has been the Manager of the Monitor National Marine Sanctuary since 1992. A diver since 1969, Dr. Broadwater has participated in shipwreck dives and investigations throughout the United States and in more than a dozen foreign countries. He also volunteered his services as an archaeologist for expeditions to the Monitor in 1974, 1979, and 1983. Between 1978 and
1989, as Senior Underwater Archaeologist of the Virginia Department of Historic Resources, he directed the Yorktown Shipwreck Archaeological Project, which culminated with the complete excavation of a British ship sunk during the last major battle of the American Revolution. A well-known author and lecturer, Dr. Broadwater wrote “Secrets of a Yorktown Shipwreck” for the June 1988 National Geographic Magazine, and the book *Kwajalein, Lagoon of Found Ships*, which chronicles shipwreck investigations in the Marshall Islands.

**Captain Tim Taylor, FN 2004**

Captain Tim Taylor is an accomplished naturalist and explorer with over 25 years of underwater experience. He is currently President and CEO of the Research Vessel Tiburon, Inc., based in Key West Florida.

Learning to dive in Maine in 1979 Tim followed his passion to Florida, where he has spent the last 25 years full time on or under the water. Over the past 18 years, Tim has owned several innovative diving operations, specializing in exploring new locations and sharing them with the scientific community and the public. He was inducted as a Fellow in the prestigious Explorers Club for his discovery of Sherwood Forest Reef in the Dry Tortugas in 2004. This reef is considered the centerpiece of the Tortugas Ecological Reserve and has become world famous since its discovery in 1997.

Tim’s experience includes 18 years as a US Coast Guard Captain, numerous instructor ratings, underwater still and video expertise, and extensive fieldwork. He produced, shot and directed “The Florida Keys Sportsman”; founded Scubaworld Online - one of the first scuba industry databases on the Internet.; and has guided many world famous researchers and explorers such as Dr Sylvia Earle and Dr Eugene Clarke on expeditions in the Bahamas, Cuba and the Florida Keys. The ocean and Key West are home to Tim, his 11 year-old Son Garett and 8 year-old daughter Brooke.
Mosaic Project
Expedition Crew:

Tim Taylor FN04 - Captain, Expedition Coordinator, Technical rebreather diving team, photographer

Jacqueline Morales - Trip Coordinator, chef, RN
Doug Rice - Technical rebreather diver, Aquatic Films, Inc.
Richard von Trapp - Technical diver, OC, diving safety officer
Kelly Selton - Technical Diver, OC
David Hare - Captain, 19th century sailing ship consultant
Patricia Ayers - Safety diver
Currier Randall, DVM - Diving supervisor
Christopher Pair - Video producer-Aquatic Films, Inc.
Andrew Davidson - Video photographer- Hodja Media, Inc.
JC Cabato - Video photographer
Garett Taylor - Participant / photography/ videography
Brooke Taylor - Participant / photography/ videography