SHIPWRECKS OFF CALIFORNIA'S COAST: RECENT DISCOVERIES IN GREATER FARALLONES NATIONAL MARINE SANCTUARY

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With over 400 known ship and aircraft losses, the Greater Farallones National Marine Sanctuary (GFNMS) is one of the greatest underwater maritime museums in the National Marine Sanctuary System and in the Nation. During the most recent expedition, several new wrecks were discovered and recorded. Two shipwrecks that were identified were Ituna, an iron-hulled fishing trawler that sank in a storm in 1920, and SS Selja, which collided with another vessel under heavy fog in 1910. The GFNMS has recently expanded to more than double its original size, and the National Oceanic and Atmospheric Administration (NOAA) is working with various agencies, including California State Parks, on a mission to record wrecks in the sanctuaries and surrounding waters.

In 2015, the State of California Department of Parks Recreation signed an agreement with the National Oceanic and Atmospheric Administration (NOAA). This agreement was signed for the purpose of California State Parks and NOAA to collaborate and seek opportunities of mutual benefit on maritime heritage research, survey, documentation, and public outreach for sites including shipwrecks and maritime cultural landscape elements on the Californian coast.

Specifically, collaboration would focus on but not be limited to NOAA's California-based National Marine Sanctuaries that include the Greater Farallones, Cordell Bank, Monterey Bay, and Channel Islands and the State Parks' 19 Underwater Areas (California State Parks and NOAA 2015).

Last year, NOAA expanded its boundaries of Cordell Bank and the Gulf of the Farallones National Marine Sanctuaries to an area north and west of the original boundaries. Specifically, the Gulf of the Farallones National Marine Sanctuary expanded to more than double its original size to include both state and federal waters and was renamed the Greater Farallones National Marine Sanctuary (GFNMS). With approximately 400 potential ship and plane wreck sites, this sanctuary boundary now overlaps with State-managed waters. Part of NOAA's maritime cultural landscape initiative focuses on researching West Coast sites, especially at this sanctuary and its newly expanded area (NOAA 2016; Schwemmer 2015a).

NOAA collaborates with federal and state agencies and the private sector to document maritime cultural resources and to create projects focused on locating and recording submerged cultural resources. Such projects provide a basis for an inventory and enhanced public awareness regarding California's maritime heritage (Schwemmer 2015a). For this particular research mission, NOAA partnered with California State Parks and the California Coastal Commission, the United States Navy, National Park Service, and private partners such as Teledyne SeaBotix, Inc. and sonar expert Gary Fabian (Figures 1 and 2).

In October 2015, NOAA and its partners successfully conducted a Phase II survey onboard the Research Vessel *Fulmar*, a 20.5-meter long vessel that is primarily used for research and monitoring. The goal of the research mission was to conduct an archaeological site characterization of the maritime heritage resources, including ship and aircraft wrecks, in the GFNMS (Schwemmer 2015a). During the eight-day mission, three new shipwrecks were discovered and two previously known shipwrecks were investigated and recorded. The mission focused on documenting newly discovered wrecks in addition to updating the site information for already discovered wrecks from previous surveys. The objective was to

Figure 1. Part of the R/V Fulmar crew during the 2015 NOAA Maritime Heritage Expedition, Greater Farallones National Marine Sanctuary. Left to right: Michael Carver; Jim Delgado; Captain Chris Eubank; Cyril Poissonnet; Robert Schwemmer; Gary Fabian; Tricia Dodds; and Marshall Stein. Foreground: Iver2 AUV and Teledyne Seabotix vLBV300 ROV. Credit: Jan Roletto.

Figure 2. 2015 Expedition team on board the NOAA research vessel Fulmar *during a visit by U.S. Navy leadership, Left to right: Captain Chris Eubank, Cyril Poissonnet, Marshall Stein, Vice Admiral Nora Tyson, Commander Third Fleet, U.S. Navy, Robert Schwemmer, Peter Hess, Gary Fabian, James Delgado, Russ Matthews, Rear Admiral Markham Rich, Commander Southwest Region, U.S.Navy, Jean de Marignac, Alexis Catsambis, Maria Brown, Kevin Tweed, and Tricia Dodds. Credit: Paul Chetirkin, NOAA ONMS.*

conduct systematic site investigations of ship and aircraft wreck sites to identify vessel type, construction details, and diagnostic artifacts (Schwemmer 2015a).

Partnering with Teledyne, the researchers used a remotely operated vehicle (ROV) to obtain data through high definition video-capture and still imagery from a GoPro camera. The Little Benthic ROV has a 300-meter depth rating and is highly capable and vectored, offering a stable and powerful platform for many applications. The ROV is portable and equipped with a variety of acoustic sensors using different scanning and multibeam sonars for target survey and identification (Figure 3) (Schwemmer 2015a).

The autonomous underwater vehicle (AUV) used is a 100-meter depth rated portable AUV with Starfish side scan sonar useful for close range side scans at 5-30 meter distances. Teledyne programmed a survey pattern into the AUV before launching it on the water's surface of each target from the R/V *Fulmar*, directing the AUV to the seabed to record the target (Figure 4). The AUV collected high definition video footage, still images, and side scan sonar of each target (Dodds 2015; Schwemmer 2015a).

Historical research was conducted before and during the archaeological investigation, and diagnostic artifacts observed on the wreck sites were researched and traced through the archaeological record. This information, when combined with additional information observed during the investigation such as hull dimension and construction features, allowed maritime archaeologists to cross reference these sites against the database records of documented vessel and aircraft losses in the sanctuary, thus identifying the vessel. No artifacts were collected during this research mission. The information obtained during this mission will enable the GFNMS management to make better informed decisions in the protection and enforcement of the cultural resources, in addition to providing educational and outreach opportunities to the public, including the West Coast Shipwreck Database website development. The identified wrecks will also be evaluated for eligibility for the National Register of Historic Places (Schwemmer 2015a).

Ituna was one shipwreck that was identified and recorded during this research expedition. *Ituna* was built for John Mackie in 1886 as a luxury steam yacht in Scotland (NOAA 2015a). In later years, Allison Amour of Chicago, Illinois purchased *Ituna.* Amour was a wealthy socialite who was keen to the natural sciences, and, in 1894, *Ituna* sailed from New York to Mexico as part of some of the earliest archaeological expeditions in Mexico, with the results published in *Archaeological Studies Among the Ancient Cities of Mexico.* In 1916, the vessel was converted to a first-class cargo steamer with passenger accommodations running between ports along Mexico and the United States West Coast under the Mexican Navigation and Commercial Company (Figure 5).

In 1918, the Frank E. Booth Canning Company of San Francisco bought *Ituna,* and it was again converted, this time to a 46-meter long seagoing fishing trawler for $65,000. It operated around San Francisco as one of the largest steam trawlers fishing off of California's central coast. It was one of the first commercial fishing vessels to introduce the otter trawl system to the Pacific coast (NOAA 2015b; Schwemmer 2015b).

On March 13, 1920, *Ituna* was en route from San Francisco to Reedsport, Oregon with machinery for the cannery and a cargo of cement in the hold, when it encountered a storm. The vessel's seams split and the forward hold flooded, and the ship eventually foundered 15 miles northwest of the San Francisco Lightship station. Fourteen crewmen were onboard, and twelve managed to make it to the lifeboat. The other two crewmen had become seasick and were trapped in their bunks and drowned as *Ituna* went down at the bow within ten minutes. The survivors fought heavy seas for seven hours before their lifeboat arrived at the San Francisco Lightship station where they were rescued (NOAA 2015b). The loss of *Ituna* 96 years ago is another reminder of the perils that ships encountered along California's treacherous coast. During the 2015 research expedition, the scientists were able to record the vessel with the ROV and AUV (Figures 6 through 9).

Figure 3. Teledyne Seabotix vLBV300 ROV. Credit: Tricia Dodds.

Figure 4. Teledyne Seabotix vLBV300 ROV used during the October 2015 research expedition. Credit: Tricia Dodds.

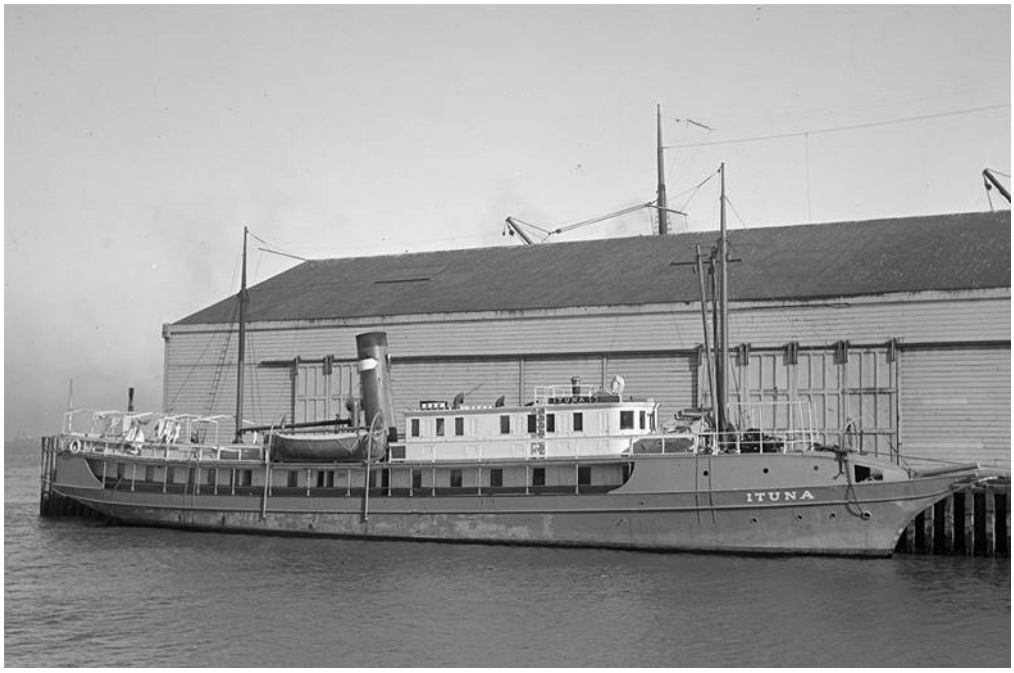

Figure 5. Passenger cargo steamship Ituna dockside circa 1917. Credit: San Francisco Maritime National Historical Park, David W. Dickie Photographs.

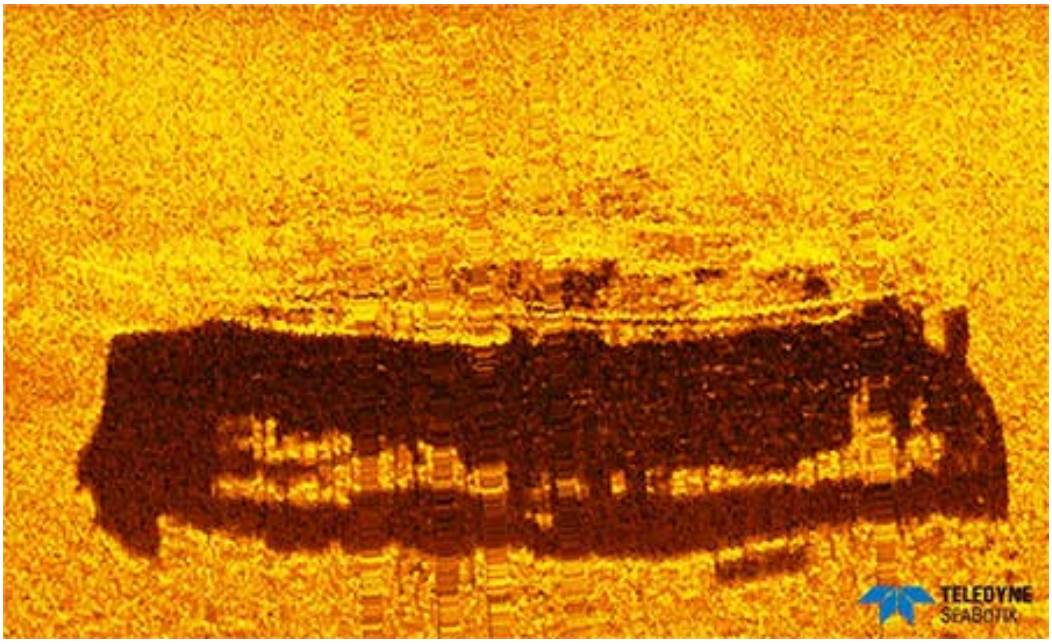

Figure 6. Side scan sonar image of shipwreck Ituna on the sea floor. Credit: NOAA-Teledyne Seabotix.

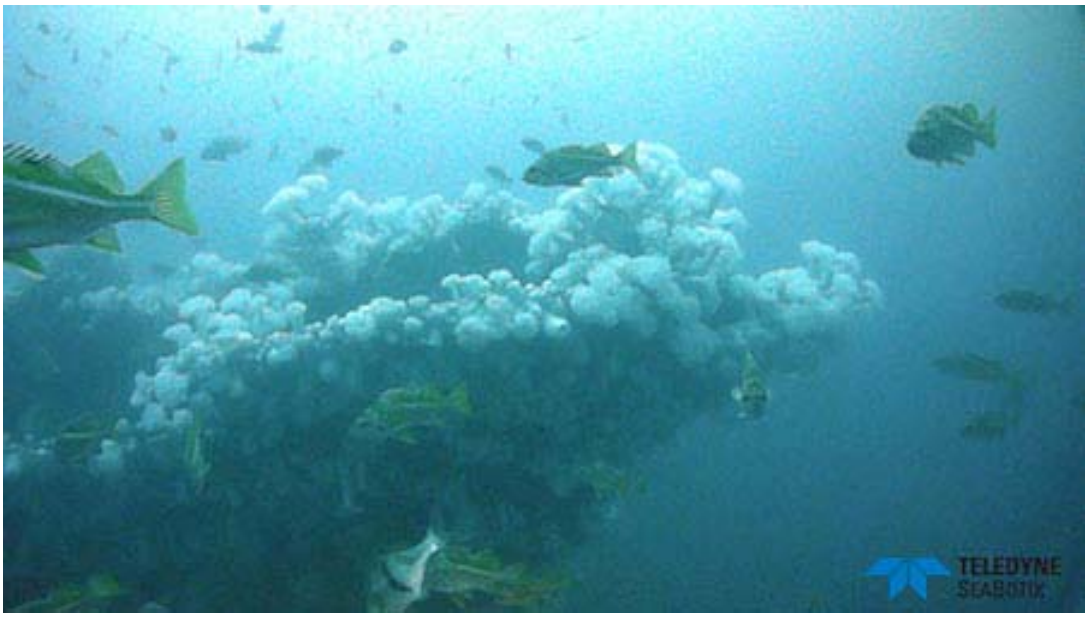

Figure 7. The clipper-ship bow of the former luxury steam yacht Ituna *provided positive identification of the shipwreck. Credit: NOAA-Teledyne Seabotix.*

Figure 8. The triple expansion steam engine built for the steam yacht Ituna *by A. & J. Inglis in 1886 in Glasgow, Scotland. Credit: NOAA-Teledyne Seabotix.*

Figure 9. Ituna was en route to Reedsport, Oregon with a cargo of concrete when it sank. The concrete was found hardened in the forward and aft cargo holds. Credit: NOAA-Teledyne Seabotix.

Another shipwreck that was investigated during this research mission was the tramp steamer *Selja*. *Selja* was a workhorse cargo steamer chartered by Portland and Asiatic Steamship Company that participated in the Far Eastern trade that was still an important part of the economy at the beginning of the twentieth century (Figure 10). Typically, SS *Selja* traveled from Portland, Oregon loaded with cargo such as lumber, timber, flour, and other typical goods from the Pacific Northwest. SS *Selja* then sailed to China and Japan to sell the cargo and take on manufactured Asian goods to return to the United States to sell the cargo in San Francisco, finally returning to Portland to begin the cycle over again (NOAA 2015c).

On November 22, 1910 on a foggy afternoon, SS *Selja* was sailing from Yokohama, Japan to San Francisco. Meanwhile, the passenger cargo steamer *Beaver* was northbound to Portland from San Francisco. Both vessels were sounding their steam whistles on regular intervals in the heavy fog. The master of SS *Selja* Olaf Lie would later confess that when he heard *Beaver's* steam whistle, he assumed that it was the Point Bonita Lighthouse's whistle 20 miles away (United States Supreme Court 1917).

Sixteen minutes later, the two vessels sighted each other in the fog, but it was too late. *Beaver* was on top of the crest of a large swell, and *Selja* was on the bottom of the trough on the same swell. *Beaver*'s bow slammed hard onto *Selja*, cutting approximately 3-4 meters deeply into the steel hull on the starboard side of the number 2 hatch. *Beaver's* stem and bow plating forward of the collision bulkhead were severely damaged (Schwemmer 2015b). SS *Selja* had ten onboard, and all but two escaped to lifeboats (*The Call* 1910). The master of *Beaver* William Kidston testified that "the SS *Selja* sank head first in ten minutes from the time she was struck. She sank in 30 fathoms of water, and when her bow struck the bottom she was almost straight on end with her stern sticking out of the water 100 feet. Then she gradually turned bottom up and sank. We rescued the Captain's wife and two children and all the crew except two Chinese" (NOAA 2015c). The two men had ventured below the decks to obtain clothing, not knowing that they would never emerge from the vessel (*The Call* 1910). As a result of the collision, a legal case over maritime law for the rules of the road at sea was argued before the United States Supreme Court. The Supreme Court ruled that both ships were traveling too fast in thick fog, and both captains were held responsible (United States Supreme Court 1917).

Figure 10. SS Selja under steam. Credit: San Francisco Maritime National Historical Park.

The SS *Selja* had been identified about 60 meters deep during a previous NOAA research expedition. During this research expedition in 2015, NOAA returned to *Selja* to fully characterize and record the wreck, utilizing an AUV to conduct a side scan sonar survey along with an ROV for visual documentation (Figure 11, Figure 12). Overall, the research expedition was a resounding success. Next, NOAA and California State Parks plan to continue the partnership to conduct a maritime cultural landscape study of the Sonoma Coast, including terrestrial and underwater surveys to further document the maritime heritage along California's coast (Dodds 2015; Schwemmer, personal communication 2016).

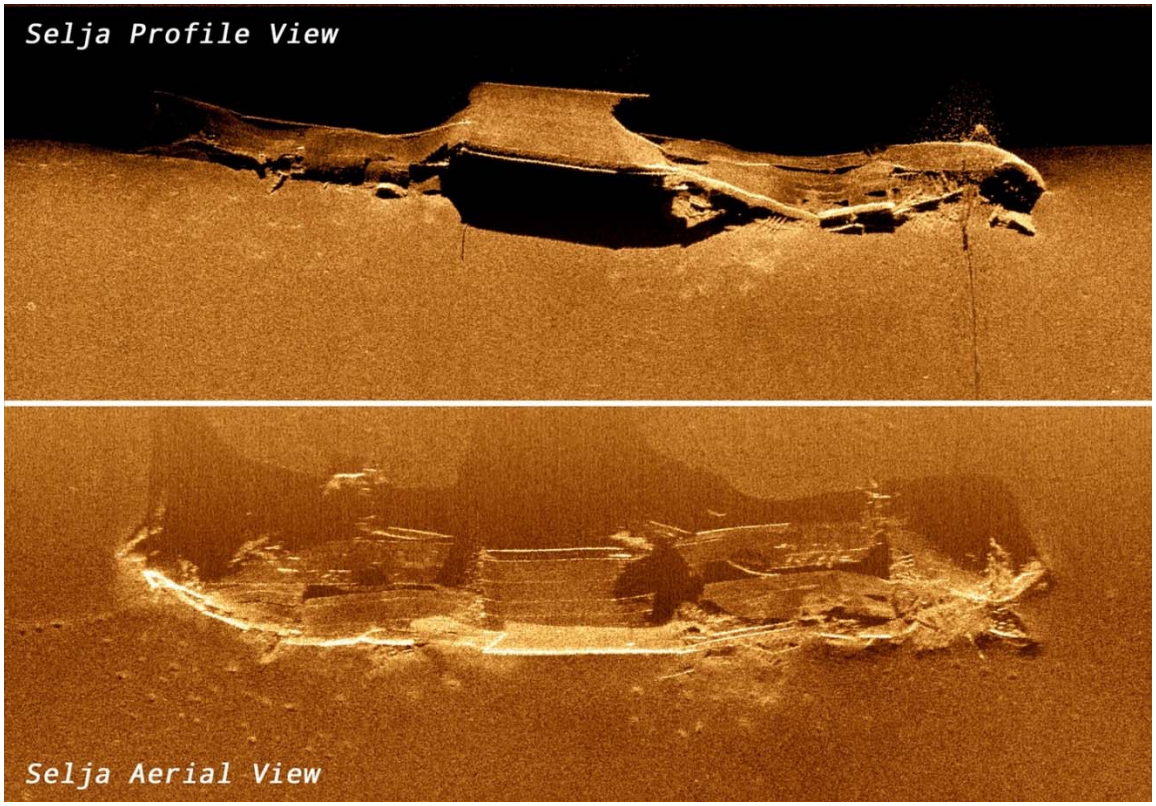

Figure 11. SS Selja side scan sonar images. Credit: NOAA-Teledyne Seabotix.

Figure 12. Steel hull of SS Selja recorded by ROV. Credit: NOAA-Teledyne Seabotix.

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