From Luxury Liners to Aircraft Carriers: USS *Wolverine* and USS *Sable*

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Abstract

During World War II, over thirty US aircraft carriers supported the war effort. None were more unique than USS *Wolverine* and USS *Sable*. Converted from the luxurious Great Lakes passenger steamships, SS *Seeandbee* and *SS Greater Buffalo*, into aircraft training carriers, the ships underwent remarkable transformations at a time when America was facing material shortages and desperately needed qualified pilots. The American Shipbuilding Company retrofitted the ships at their docks at Cleveland and Buffalo. The Navy commissioned the USS *Wolverine* on August 12, 1942, and USS *Sable* on 8 May 1943, assigning them to Chicago's Navy Pier. The twin flattops serviced over 136,000 landings and trained over 15,000 pilots. The custom carriers made invaluable contributions to the American wartime naval capacity. The stories of USS *Wolverine* and USS *Sable* live on through continued research efforts and exhibits that spark public interest in this amazing program.

Keywords: USS *Wolverine*; USS *Sable*; World War II; naval aviation; aircraft carriers; Glenview Naval Air Station

INTRODUCTION

As Chicago River Boat Tours pass by Navy Pier, docents take the opportunity to talk about long-forgotten, jerry-rigged carriers with postage-stamp-sized flight decks that enabled pilots to practice take-offs and landings at "sea." Mistakes and accidents sent many planes into the water, and wrecks still dot the lakebed. The US Navy has located some of them in their watery graves, and they have recovered and restored or displayed a few of them, but the full story of this creative training program for naval pilots has not been told.

As context, the Naval High Command was already brainstorming ideas to provide training for carrier crew and pilots before Pearl Harbor due to the widening of World War II. With Japanese ships a potential threat to the West Coast, the Navy searched for safe waters to harbor such carriers. Naval Comdr. Richard F. Whitehead proposed to Naval Command to train naval carrier pilots on the Great Lakes, but his plan was ignored until after the Pearl Harbor disaster.[1]

Comdr. Whitehead pushed the Great Lakes for training naval pilots because the lakes were essentially safe from enemy attack, and weather conditions, especially on Lake Michigan, resembled oceanic weather patterns and conditions. Water turbulence would mimic the rolling and pitching of ocean carrier decks. Since the lakes had no U-boat threats, heavy armor plating was not needed. The weight reduction translated into speedier ships and less fuel consumption.

A significant advantage of the Great Lakes plan was the close proximity to Glenview Naval Air base with its full complement of air cadets already in flight training.[2] Other military installations in the Chicago area, notably Naval Training Station Great Lakes, Naval Reserve Aviation Base Great Lakes, and Navy Pier, also

provided necessary facilities and volunteer recruits. NAS Glenview was also home for contingents of WAVES (Women Accepted for Volunteer Emergency Service), a military unit within the US Navy. Naval Command authorized the Carrier Qualification Training Unit and it officially began operations on August 1, 1942.[3]

RESEARCH METHODS AND SOURCES

The historical research relied on visiting several archives and museums to locate and review military documents, postcards, film reels, and other primary sources, in order to document the step-by-step process used to convert SS *Seeandbee* into USS *Wolverine* and SS *Great Buffalo* into USS *Sable*. This research involved compiling and analysing the destruction of the wooden cabins on the passenger steamers and the conversion effort to relocate the coal stacks from the center of the deck to the side to make the deck resemble a flight deck of an actual sea-going carrier. Secondary sources were also used to create a rich, detailed accounting of the conversion efforts.

The National Archives and Records Administration in Washington, DC, and the Chicago Regional National Archive house some two thousand pages of deck logs and operational accounts. These records include ship lines and blueprints, photographs, accident reports, and communications between naval officials and contractors concerning operations of the vessels. Chicago's Navy Pier has a museum with artifacts from the vessels and the reconstruction of the pier itself to accommodate the ships.

SS Seeandbee Selection

After establishing the new carrier training initiative at NAS Glenview and Navy Pier, the next decision the Navy faced was whether to build the new carriers in the lakes or to convert ships already on the lakes that could fit the parameters of aircraft carriers. To build from scratch would tie up shipbuilding facilities. Converting existing ships was determined to be the cheaper and fastest option, given the pressing need for training carrier pilots.[4]

Navy requirements for selecting a potential training carrier was a flight deck of at least 500 feet and the capability to reach a speed of 18 knots to assist planes on take-off. Despite the sheer number of ships already sailing on the lakes, a surprisingly few could meet these criteria. Comdr. Whitehead's 1941 ship survey narrowed the options to two: SS *City of Midland* and SS *Seeandbee*, the latter a luxury passenger steamer on the Great Lakes. Since SS *City of Midland* was already contributing to the war effort, the Navy requisitioned SS *Seeandbee* on March 12, 1942.[5]

SS Seeandbee History

The Detroit Shipbuilding Company of Wyandotte, Michigan, launched SS *Seeandbee* in 1912 for the Cleveland & Buffalo Transit Company (C&B). Stephen Kirby, a respected shipbuilder, owned Detroit Shipbuilding in partnership with his father, Frank E. Kirby, who was famous worldwide as the premier naval architect on the Great Lakes.[6] At its launching SS *Seeandbee* was the largest side-wheel passenger steamer in the world, measuring 500 feet in length, with a beam of 96.5 feet. It carried 1,500 passengers, mostly honeymooners and conventioneers, with 510 rooms; its stately ballroom was the highlight of the trip for many of the passengers.[7] The large size made SS *Seeandbee* ideal for a flight deck in terms of its length and width, and its steel hull was strong enough to support a flight deck after the Navy removed the upper deck and

superstructure. It was both fast and elegant, with a top speed of 22 knots and a 12,000-horsepower, inclined-compound steam engine.[8]

CONVERSION OF SS *SEEANDBEE* TO USS *WOLVERINE*

The Navy selected American Shipbuilding Company, the largest shipbuilding company on the Great Lakes, because it had the experience and capacity to convert SS *Seeandbee*.[9] The conversion story rests on detailed naval documents and photographs. Newspaper reports are sketchy at best, given the shroud of secrecy covering the conversion. On a wider front, the urgent work took place while dismayed Americans read newspaper accounts of the disastrous Allied naval forces back-peddling before Japanese forces in the Pacific theatre.[10]

During the war, the military's need of metals for ships, planes, jeeps, guns, and even ration tins and helmets, grew rapidly and soon the essential materials were in very short supply. President Franklin D. Roosevelt established the War Production Board on 6 January 1942, to regulate industrial production and allocate war materiel and fuel.[11] The board coordinated heavy manufacturing and rationing of vital materials−steel, galvanized plate, tin, copper, rubber, and oil.

American Shipbuilding keenly felt the shortages in the early stages of the conversion process. On April 29, 1942, the Supervisor of Shipbuilding notified the head of the Bureau of Ships that the "determining feature in the completion of the vessel will be material."[12] Steel was the critical material. The contractor had such great difficulty obtaining steel that the Supervisor of Shipbuilding permitted the use of "warehouse material for shapers where proper material can be obtained' and also 'galvanized plate . . . even though the latter involves a slight excess in cost."[13]

Deconstruction work on SS *Seeandbee* continued while the company scrounged for steel. In early May 1942, American Shipbuilding towed the stripped hull from Cleveland to their dock (formerly the Buffalo Dry Dock) at the foot of Michigan Avenue in Buffalo. On the 10th the company ramped up the stripping crew tenfold, from 125 to 1,250, drawing workers from the Buffalo area and as far away as Chicago and New York City. Shifts worked around the clock to finish stripping the hull as swiftly as possible.[14]

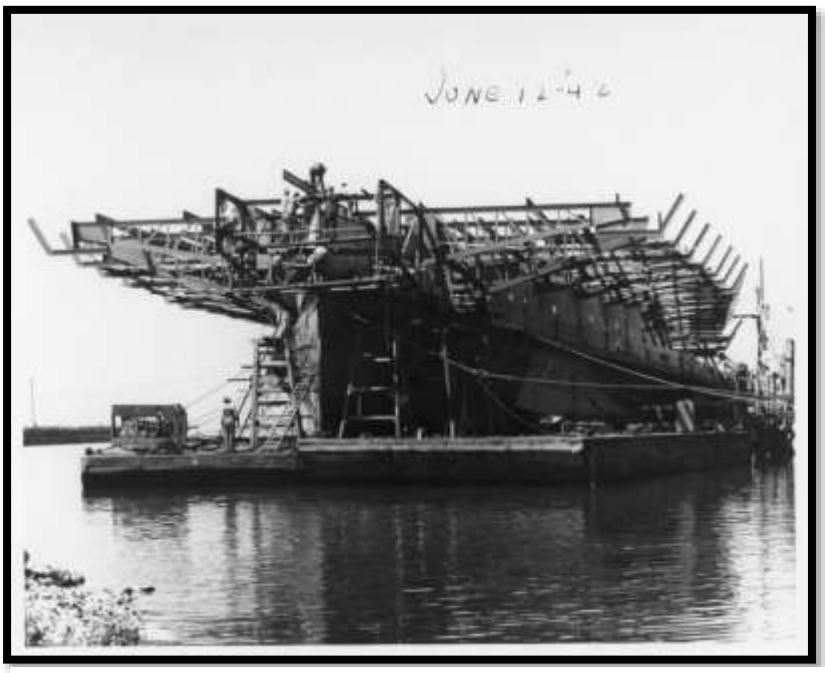

Figure 1 SS Seeandbee being retrofitted, June 12, 1942 (Courtesy, Naval History and Heritage Command).

With the majority of the demolition work completed, workers started on retrofitting SS *Seeandbee* to build the flight deck. Workers had to reroute the stacks to starboard to imitate the island structure of a combat carrier. The craftsmen completed installing the steel supports for the flight

deck and started building the deck with wood, as was customary for decks at that time (fig 1). The sheer scale of the effort was newsworthy: "Forty-five miles of welding went into the job. The amazing total of 57,000 bolts went into her, and a like number each of washers and grommets—packing which makes the bolts watertight."[15]

Given delays in delivering materials, especially landing lights and radio apparatus, the Navy set the estimated commissioning date back a month to August 15, 1942.[16] All the heavy work on the deck was completed by mid-July, except for the chain locker and casings around boiler room fans on the main deck, and some side panels along the main deck. Wood planking was nearly 90 percent complete, and the task would be finished by July 20, including caulking. Most of the forward and aft bracing was also finished, and company officials anticipated completion by July 22. They expected to finish building a new island structure to house the command and control operation by the end of the month.[17]

As of August 1, 1942, with the commissioning date of the 15th looming, the forty-two landing lights had not arrived. On August 5 the vessel was still missing basic navigational gear, such as sounding leads, binoculars, and sextants, even though the items had been shipped from Norfolk to the Ninth Naval District on July 22. Without these items, the ship would not be able to steam from Buffalo to Chicago, although lake trials were doable since the vessel would stay within sight of land. In the end, all the needed equipment came in the nick of time.[18]

The required ship speed to launch planes without catapults was 22 knots. USS *Wolverine's* maximum speed was 22 knots. However, after the addition of heavy steel frames for the flight deck, its average speed slowed to 18 knots.[19] This meant that for aircraft to achieve take-off speed, the carrier had to sail into the wind. On days with little wind, they had to halt operations.

August 22, 1942 – Commissioning in Chicago

As of August 20, 1942, the newly-minted USS *Wolverine* was in route to Chicago, where a commissioning ceremony took place on the 22nd. Naval air tactics delighted tens of thousands of curious Chicagoans who gathered at the lakefront ceremony to get a close-up look at the first and only aircraft carrier on the Great Lakes, and the only coal-burner in the US Navy at the time. The ceremonies were particularly designed to spur the enlistment of naval aviation cadets.[20]

Although the conversion of a passenger steamer to an aircraft training carrier took more time than the Navy wanted, it still took less time than the contractor thought possible—only fifty-nine days after the superstructure was removed, despite material and personnel shortages. Five months after USS *Wolverine* went into service, the Navy awarded American Shipbuilding Company its Army-Navy E Award, signifying that it achieved 'Excellence in Production' of war equipment.[21]

Selection of SS *Greater Buffalo* The Navy requisitioned SS *Greater Buffalo,* a Great Lakes luxury excursion vessel owned by Detroit & Cleveland Navigation Company, on August 1, 1942, to convert it into USS *Sable* as a semi-sister ship to USS *Wolverine*.[22] SS *Greater Buffalo*, built in 1924 by the American Ship Building Co. of Lorain, Ohio, was ideal because it was one of the world's largest freshwater side-wheelers, weighing 7,739 gross tonnage and 3,330 net tonnage. SS *Greater Buffalo* was still in good condition when the Navy purchased it, according to the condition survey done by the Naval Department of Maintenance and Repair Division (fig 2).[23]

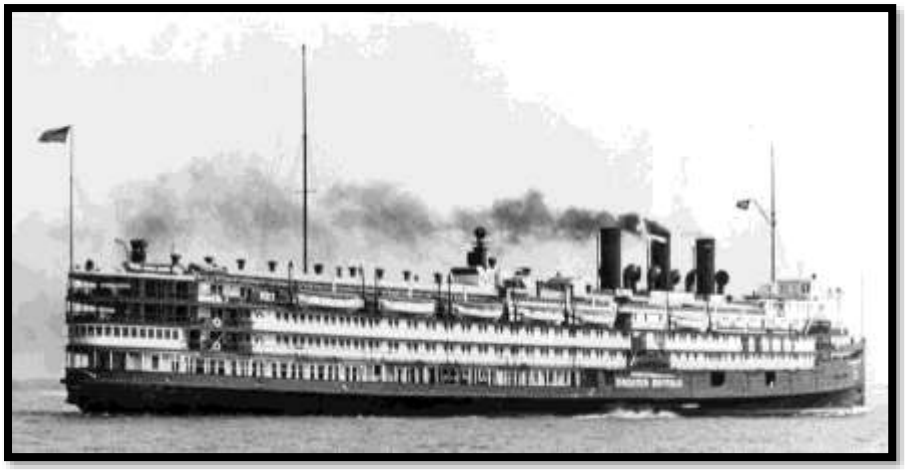

Figure 2. SS *Greater Buffalo* arriving at Buffalo for conversion, August 8, 1942 (Courtesy, Thunder Bay Sanctuary Research Collection).

CONVERSION OF SS *SEEANDBEE* TO USS *WOLVERINE*

Similar to the SS *Seeandbee* conversion, SS *Greater Buffalo* was on a very tight timeline, with conversion to begin on August 7 and completion set for October 31, 1942. The Navy hired American Shipbuilding Company again, and they requested that the Bureau of Ships deliver needed materials as soon as possible. However, the Bureau in a cost-cutting effort requested a detailed inventory of all materials still on hand from the USS *Wolverine*'s conversion that could be repurposed, especially the existing gyro-compass equipment.[24]

The Navy renamed SS *Greater Buffalo* as USS *Sable*.[25] On September 30, team leaders met aboard the vessel to discuss lessons learned in the first conversion. Helpful recommendations included boosting the capacity of the flight deck davit to hoist weights of 1,000 lbs, providing adequate compartment drainage in all workshops, and making sturdier and wider side ladders. Finally, lifeboats were suspended from the flight deck, so they could be launched while the ship was underway.[26]

The Bureau of Ships engineers had to address a major design issue concerning the location of the air plot, radar plot, and flight deck light rooms. The only access to these areas was through the radar control room. They decided to move a six-foot door off the centreline to port between the flight deck light room and the air plot room, and build an arch between the two rooms to create space for a separate passageway on the forward side of bulkhead number 55.[27] The schedule called for the installation of arresting units, accumulators, yielding elements, and spares for the end of September. However, by the third week, the contractors realized that this delivery date was unrealistic. The shipment of critical items was deferred, except for five arresting units, which were kept in a dry, confidential location until needed.[28]

On October 3, 1942, the Supervisor of Shipbuilding sent out an extensive list of engineering recommendations and a summary of the September 30 conference.[29] Based on these recommendations, the Bureau of Ships laid out its decisions on November 1, 1942. The Bureau rejected many of the recommended improvements as unnecessary, such as designing a way to launch service boats while underway. US Coast Guard escort ships could perform this function.[30]

Engineers discovered a serious design flaw in October concerning the main engine installation. Steam piping to the engine ran directly from the boiler stop valve to the complicated main throttle valves gear. In case of an emergency involving that valve gear, the valve at each of the main boiler stop valves would have to be closed. These time-consuming steps constituted a major safety hazard. The proposed solution was to

install a satisfactory main stop valve in the main steam line that could be operated in the engine room. The Bureau considered the lack of a main stop valve to be urgent, requiring the contractor's immediate attention.[31]

On November 2, 1942, the Bureau of Aeronautics recommended that the arresting gear arrangement could be enhanced by lengthening the landing area on the flight deck, but without lengthening the deck itself. The contractors addressed the recommendation by adding eight arresting units, eleven arresting wires, and three barriers.[32]

Steel Decking

The most significant design decision for USS *Sable* was to switch from the traditional wood deck used on USS *Wolverine* to an experimental steel flight deck. Navy documents do not discuss why they decided to experiment with steel decking. However, as with the shift from wooden-hulled to metal-hulled ships, using steel in place of wood was a natural technological advance to service heavier and faster aircraft.

On November 16, 1942, the Bureau of Ships held a very important conference to discuss how to experiment with steel decking to find the ideal 'specs' and applications for flight decks.[33] The Bureau faced several considerations, but the consensus was to swap wood decking for five-pound steel decking. They accepted the original designs of flight deck fittings for lights, sheaves, yielding elements, and securing tracks, but asked American Shipbuilding designers to figure out how to combine the fittings with the two decks.

The Robertson Company agreed to provide an engineer to work with American Shipbuilding engineers on installing the deck.[34] After the conference concluded on November 19, 1942, the Bureau officially authorized the modification of the flight decking from wood to steel. With this official change, the Navy estimated the earliest practical completion date would be March 1, 1943, a troubling six months later that the original target date of October 31, 1942.[35]

Since the results of this installation would be fed into other ocean-going ship designs, the Bureau decided to use galvanized steel on the forward most of the three sections of the so-called Robertson decking, including both corrugated and flat deck plating. They wanted to understand what issues they might encounter when applying galvanized decking. The Navy tested the viability of the 'Robertson decks' against 'Navy decks' by installing both versions on the new flight deck using a checkerboard pattern.[36]

Figure 3. USS Sable that shows steel decking differences, June 1945 (Courtesy, Naval History and Heritage Command).

The Navy also tested eight types of commercial non-skid coatings by laying them out on the deck in alternating sections from stem to stern, with each type getting roughly forty ship frames worth of surface area, as seen in figure 3. In the end, Navy engineers concluded that Robertson steel plate deck was likely too light to stand up well. But they approved it anyway, because USS *Sable* would only be needed as a training carrier for two or three years.[37]

Robertson Company contractors increased their steel thickness in the lower corrugated portion from 10-guage to 12-guage, which boosted the total weight of the decking by 16 lbs. per square foot. Navy decks consisted of 10.2 lb. steel plates that were stiffened transversely by 3" x 3" x 5/16" T' shaped beams, with 12" centers. The T's, with the flange or horizontal side down, were laid on top of longitudinal girders. (To visualize T's, think of I-shaped rails on railroad tracks but without one flange.)[38]

Final Installations

Pushing the completion date back six months gave engineers more time to install electrical cables and wire radio equipment. The result was a neater cable bundle, plus the inclusion cables to the landing signal officer's (LSO) aft platform that had been left out on USS *Wolverine* in the rush to meet the completion deadline.[39] The contractors were still modifying the arrangement of flight deck barrier wires in mid-December 1942 to fit the structure of the pilothouse and location of the weather tight doors. By moving the barrier wires forward six feet, but keeping the barriers the same distance apart, the doors and the wires would clear each other.[40] They also had to wait on arresting gear accumulators due to a shortage, which put the entire project in jeopardy for more than two months. Active duty warships had priority on this critical component.

On 15 February 1943, Lt. J. J. Manley D-V(S), USN Captain R. L. Bowman, and USN Lt. R. A. Haynie D-V(S) inspected the vessel and approved the work.[41] Unfortunately, icy weather conditions affected welders working on the steel deck, which delayed the conversion process even further. In the end, USS *Sable*'s completion date was pushed back almost another month, to March 29, 1943.

Figure 4 USS Sable moored at Chicago's Navy Pier during WWII (Courtesy, Naval History and Heritage Command).

Final Inspections and Commissioning

American Shipbuilding Company submitted a summary report on April 2, 1943, which revealed a huge cost overrun of $301,000, largely due to repeated design changes while the work was in progress. Most important was changing the steel on the flight deck after the deck had been laid. Workers had to spend many hours with blow torches cutting off the old deck, rather than working

on the conversion. This change of direction also meant that the vessel was left uncovered in bad weather, which doubled the cost of steel and raised overhead costs.[42]

Finally, on May 8, 1943, the sleek USS *Sable*, with its silhouette lowered and black and white paint replaced with battleship grey, entered service under Lt. W. K. Berner, who was the Navy staff commander at the Norfolk, Virginia, naval base.[43] However, the Navy had to delay the sea (lake) trials until May 12, 1943, because the ship could not leave the dock due to ice on Lake Erie and poor visibility for the accompanying officers. The vessel departed for Chicago a few days after its trials, with the promise that all minor issues discovered during the trials could be fixed satisfactorily before flight training began.[44]

While the steel flight deck decision, combined with poor weather and material shortages, delayed the predicted fast turnaround, USS *Sable* still went into service less than a year after being purchased by the Navy. USS *Sable* sailed the Great Lakes over the summer of 1943 to familiarize pilots with shipboard landings, and the vessel moored at Navy Pier (fig 4).[45] The Navy now had two vessels dedicated to qualifying pilots to land and take off from carriers, helping to turn the tide of the war in the Pacific.

Training Carriers: Use and Effectiveness

The most significant impact that the USS *Wolverine* and USS *Sable* flattops had during World War II was that thousands of pilots and carrier personnel were certified from their decks. The Navy accomplished this remarkable feat with limited resources and under extreme pressure to get pilots and support personnel to the war theaters. During the three years of the training program from 1942 to 1945, the Navy trained 17,820 pilots to land on carriers.[46] In addition, 40,000 sailors were trained, including landing signal corpsman, radio signal and radar operators, and other support personnel.

USS *Wolverine* successfully launched its first aircraft on August 25, 1942.[47] The training program operated seven days a week, only stopping for bad weather. Since the pilots were at NAS Glenview for only a few days, the training routine was intense. Take-offs and landings were constant, totaling around 300 flights per day. One career naval aviator (unnamed), who qualified in 1943 as an eighteen-year-old, said: "We spent a couple of days practicing approaches to the training field, and when our instructor thought we were ready, he sent us to the carrier."[48]

Figure 5 A F6F Hellcat hangs over the starboard side, after running off the deck and over the side of USS Sable, with guard boat following (Courtesy, Warbird Information Exchange via Mark Allen).

Navy pilots had to master a very complex, coordinated series of steps to safely land on the flight deck. First, they had to make sure to deploy

the landing flaps, wheels, and tail hook as they approached the ship. Simultaneously, they had to cut their speed as much as possible without stalling out and watch for their signals from the Landing Signal Officer (LSO), who was monitoring the approach. At the last moment, pilots would cut the engine and drop onto the flight deck, catching the hook wire to stop the plane in a sudden jerk.[49] Each aviator had to make eight (later reduced to six[50]) successful flights, which meant not crashing on the flight deck or into Lake Michigan (fig 5).[51]

The training program did not include night operations, but the pilots dealt with limited visibility due to snow, wind gusts, and clouds of exhaust smoke from the ship's engines. When the pilots took off, the cockpit canopies had to be open for safety reasons, so they also had to suffer through cold, blustery winter winds to take their training runs. Additionally, the flight decks were only 27 feet above the water, making it quite dangerous to land on the ship.

Evaluation

The overall training operation was a huge success. Throughout the war effort between 1942 and 1945, the Navy qualified 17,820 pilots for carrier duty and trained 40,000 sailors to work on carriers. Pilots completed nearly 136,000 successful landings on the ships.[52] The Navy expected mishaps during this demanding training program and it turned out that 122 planes crashed, including 38 SBD Dauntless planes and there were more than 200 separate flight deck accidents. The majority of the time, pilots were not seriously injured, but sadly, eight naval aviators lost their lives.[53]

In the end, thousands of pilots who successfully qualified on USS *Wolverine* and USS *Sable* went on to serve in combat. Lt Comdr. J.P. Preston, commander of the CQTU (Carrier Qualification Training Unit), estimated 80 percent of navy and marine pilots who saw combat in the Marshall Island campaign conducted their training flights aboard the flattops.[54]

IMPACTS OF THE SHIPS AND AIRCRAFT TRAINING CARRIER OPERATION AFTER THE WAR

Within weeks of the Japanese surrender on August 14, 1945, the Navy decommissioned the USS *Wolverine* and USS *Sable*, and shut down the CQTU. The skies above Chicago were suddenly quiet; it was the end of an era. In November 1945, the vessels were struck from the Naval Vessel Register. USS *Wolverine* was sold for scrap metal in 1947.[55] Before USS *Sable* was auctioned off, the Great Lakes Historical Society proposed to convert the historic vessel into a museum for Great Lakes history at Put-In-Bay, Ohio, near the Commodore Perry monument. However, the society was unable to raise enough money and the vessel was sold for scrap metal in 1948.[56]

Modern Day Press Coverage and Exhibits

The aircraft carrier training operation faded from view for over forty years, but in the past fifteen years, stories about the USS *Wolverine* and the USS *Sable* and the aircraft have steadily gained regional popularity and national recognition. Historians, archeologists, and the popular press are actively working to document and promote the ships' historical significance. The informative *Heroes on Deck* documentary, produced by the Chicago Marine Heritage Society, has aired on many public television stations and has been shown at various museums, piquing the public's interest in the unique operation.[57] Several newspaper and magazine articles have also been published on the

ships and their role in the war effort, the planes that have been pulled from Lake Michigan, and the pilots who flew them.[58]

Museum exhibits have raised awareness of these cultural assets. The Air Zoo Aerospace & Science Experience Museum has a rich history of honoring and celebrating air and space flight, and houses a model of USS *Wolverine* built by master model builder Bill Waldorf,[59] and displays a restored FM-2 Wildcat, a restored SBD-3 Dauntless (BuNo. 06624), and a Dauntless under restoration.[60] The Grand Traverse Lighthouse Museum staff have done extensive research to commemorate secret naval training and testing conducted in northern Michigan during World War II, and created the *Lake Michigan Aircraft Carrier Exhibit*, which includes artifacts from Tim Claggett who qualified on USS Sable, and a model of USS *Sable* and an aircraft model that an Eagle Scout constructed with Lego® building bricks.[61] The Michigan Maritime Museum produced the *Lake Michigan's Call to Duty* exhibit highlights the extensive mobilization for the war in the Lake Michigan region and details the Great Lakes training carrier program with photographs and information about the conversions of the two ships and aircraft recovery efforts on Lake Michigan. The model of USS Wolverine from Air Zoo is also on display.[62] The Chicago Maritime Museum focuses on the developing story of Chicago's maritime traditions and impact, and has the *USS Wolverine Exhibit*, which that includes a model of USS *Wolverine* built in 1991 by William G. Ballenger.[63] The topic is finally receiving the attention it deserves.

CONCLUSION AND NEXT STEPS

During World War II, over thirty US aircraft carriers supported the war effort. Arguably, however, none were more unique than the USS *Wolverine* and USS *Sable*. Converted from lavish Great Lakes passenger steamships into aircraft training carriers in 1942-1943, the ships underwent an incredible transformation at a time when America was facing material shortages and desperately needed qualified pilots. The unique flattops had a major impact on pilot training and technology research. They facilitated some 136,000 carrier landings, and in total, 17,820 naval aviators qualified for combat carrier duty on the two ships and 40,000 sailors trained for deck crew positions. USS *Wolverine* and USS *Sable* made invaluable contributions to the American wartime naval capacity and with more planes likely on their way to the surface, the ships and the planes will be in the spotlight in the future. Stories of the ships live on through continued research efforts and engaging exhibits that showcase this unique program.

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Endnotes

[1] Wayne H. Heiser, *US Naval and Marine Corps Reserve Aviation*, 2nd ed. (McHenry, IL: Dihedral Press, 2006), 1:146; Paul M. Somers, *Lake Michigan's Aircraft Carriers* (Charleston, SC: Arcadia, 2003), 10.

[2] Therese Gonzalez, *Great Lakes Naval Training Station* (Charleston, SC: Arcadia Publishing, 2008), 71.

[3] "U.S. Naval Air Station Glenview: The Final Salute, 1937- 1995," *GNAS Base Closure Magazine*, 1995, 10; Somers, *Lake Michigan's Aircraft Carriers*, 81.

[4] Somers, *Lake Michigan's Aircraft Carriers*, 19.
[5] Somers, *Lake Michigan's Aircraft Carriers*, 43.
[6] Chris Engle, "Frank E. Kirby: Architect of Detroit's Floating Palaces," *Michigan History*, 103 (September-October, 2019), 23-27; "Kirby, Frank E.," *Encyclopedia of Detroit* (Detroit, MI: Detroit Historical Society), https://detroithistorical.org/learn/encyclopedia-of-detroit/kirby-frank-e; Nick Robins, *The Coming of the Comet: The Rise and Fall of the Paddle Steamer* (Barnsley, Great Britain: Seaforth Publishing, 2012), 106-7.
[7] *Case Western Reserve*, "Seeandbee," *Encyclopedia of Cleveland History (Cleveland, OH: Case Western Reserve)*, https://case.edu/ech/articles/s/seeandbee.
[8] Somers, *Lake Michigan's Aircraft Carriers*, 43; Engle, "Frank E. Kirby," 103:27.
[9] *Case Western Reserve*, "American Shipbuilding Company," *Encyclopedia of Cleveland History (Cleveland, OH: Case Western Reserve)*, https://case.edu/ech/articles/a/american-ship-building-co.
[10] Naval Correspondence, SS *Seeandbee* Inventory Index, From the Cleveland and Buffalo Transit Company to the War Shipping Administration, March 12, 1942, Folder C-IX64, Box 414, Section A1 1266-F, Record Group 19, National Archives Records Administration II. (hereinafter C-IX64/414/A1 1266-F/RG 19/NARAII).
[11] Franklin D. Roosevelt, 'Executive Order 9024 Establishing the War Production Board,' US Government, January 16, 1942. Available online by Gerhard Peters and John T. Woolley, The American Presidency Project, https://www.presidency.ucsb.edu/node/210828.
[12] Naval Correspondence, From the Supervisor of Shipbuilding, Cleveland, OH, to the Chief of the Bureau of Ships, April 29, 1942, C-IX64/414/Al 1266-F/RG 19/NARAII.
[13] Naval Correspondence, April 29, 1942, C-IX64/414/Al 1266-F/RG 19/NARAII.
[14] Jack O'Brian, "Plane Carrier Wolverine Taken Over by Navy Crew," *Buffalo Courier Express*, August 13, 1942.
[15] O'Brian, "Plane Carrier *Wolverine*," 24.
[16] Naval Correspondence, From the Assistant Supervisor of Shipbuilding, USN, and the American Shipbuilding Company, Buffalo, NY to the Supervisor of Shipbuilding, Cleveland, OH, July 16, 1942, Folder "IX64 Vol. 1-2," Box 412, Section A1 1266-F/ Record Group 19, National Archives Records Administration II.
[17] Naval Correspondence, July 16, 1942, IX64 Vol.1-2/412/A1 1266-F/RG 19/NARAII.
[18] Naval Correspondence, Memorandum for Captain N. L. Rawlings, USN, August 13, 1942, Folder "Vol. 2," Box 413, Section A1 1266-F, Record Group 19 National Archives Records Administration II.
[19] Naval Correspondence, Memorandum for Captain N. L. Rawlings, USN, August 13, 1942, IX64 Vol. 2/413/A1 1266-F/RG 19/NARAII; Somers, *Lake Michigan's Aircraft Carriers*, 43.
[20] "Lake Aircraft Carrier to be Here Saturday," *Chicago Tribune*, August 18, 1942; "'S*eeandbee*' Transformed into Aircraft Carrier," *Times* (Munster, IL), August 18, 1942; "Great Lakes' First Aircraft Carrier is Placed in Service," *Daily Times* (Davenport, IA), August 22, 1942
[21] "Plant Gets Award on Ship Rebuilding," *Democrat and Chronicle* (Rochester, NY), January 20, 1943.
[22] "Convert Second Lake Boat into Plane Carrier," *Chicago Tribune*, August 14, 1942.
[23] Somers, *Lake Michigan's Aircraft Carriers*, 46.
[24] Naval Correspondence: Department of Maintenance and Repair Division to the Secretary of the Navy, August 10-13, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.
[25] Naval Correspondence: The Vice Chief of Naval Operations to the Secretary of the Navy, September 19, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.
[26] Naval Correspondence: Supervisor of Shipbuilding, USN, Cleveland, OH to the American Ship Building Company, October 3, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.
[27] Naval Correspondence: Chief of Bureau of Ships to Supervisor of Shipbuilding, USN, Cleveland, OH, September 24, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[28] Naval Correspondence: Chief of the Bureau of Aeronautics to the Supervisor of Shipbuilding, USN., c/o American Shipbuilding Company, Buffalo, NY, and Supply Officer, Norfolk Navy Yard, Norfolk, VA. September 8, 1942, Folder "IX-81 Restricted," Box 418, Section A1 1266-F, Record Group 19, National Archives Records Administration II.

[29] [29] Naval Correspondence, October 3, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[30] Naval Correspondence: The Chief of the Bureau of Aeronautics to the Chief of the Bureau of Ships, November 2, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[31] Naval Correspondence, October 3, 1942

[32] Naval Correspondence, November 2, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[33] Navy Department Bureau of Ships: Memorandum for File, November 16, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[34] Naval Correspondence: Supervisor of Shipbuilding, USN, Cleveland, OH, to the Chief of the Bureau of Ships, November 23, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[35] Naval Correspondence, November 23, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[36] Memorandum for File, November 16, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[37] Memorandum for File, November 16, 1942.

[38] Memorandum for File, November 16, 1942.

[39] Naval Correspondence, November 23, 1942.

[40] Naval Correspondence: Supervisor of Shipbuilding, USN, Cleveland, OH, to the Chief of the Bureau of Ships, December 14, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[41] Naval Correspondence: Commanding Officer, USS *Wolverine*, to Bureau of Ships, DC, February 15, 1943. Folder "IX-81 Vol. 2," Box 418, Section A1 1266-F, Record Group 19, National Records Administration II (herein abbreviated as IX81 Vol.2/418/A1 1266-F/RG 19/NARAII.).

[42] Naval Correspondence: Resident Cost Inspector from the American Shipbuilding Company to the Officer-in-Charge, Branch Office of the Supervisory Cost Inspector, 3rd Naval District, Buffalo, NY, April 2, 1943, IX81 Vol.2/418/A1 1266-F/RG 19/NARAII.

[43] "Second Lakes Liner Turned into Carrier," *Detroit Free Press*, May 9, 1943, 1.

[44] Trial Board, Office of Supervisor of Shipbuilding, USN, Cleveland, OH to President, Board of Inspection and Survey, June 4, 1943, Folder "IX-81 Restricted," Box 418, Section A1 1266-F, Record Group 19, National Archives Records Administration II.

[45] Trial Board, June 4, 1943, Folder "IX-81 Restricted," Box 418, Section A1 1266-F, Record Group 19, National Archives Records Administration II.

[46] Somers, *Lake Michigan's Aircraft Carriers*, 113; "Fresh-Water Flattops—The U.S. Navy's Forgotten Great Lakes Aircraft Carriers," Military History Now (website), August 29, 2016, https://militaryhistorynow.com/2016/08/29/fresh-water-flattops-the-u-s-navys-forgotten-great-lakes-aircraft-carriers/.

[47] Hill Goodspeed, "Lake Michigan's Naval Aviation History," *The Sextant*, September 27, 2019; Joe Hyams, *Flight of the Avenger: George Bush at War* (San Diego: Harcourt Brace Jovanovich, 1991), 49.

[48] Bill Lee, *Paddlewheel Aircraft Carriers: A Prime Example of Necessity Being the Mother of Invention*, August 21, 2009, 4. https://docplayer.net/39858103-Paddlewheel-aircraft-carriers.html.

[49] Andrew Knighton, "How the US Navy Trained Its Pilots in WWII: The Bar for Entry was High," *War History Online*, October 5, 2017, https://www.warhistoryonline.com/world-war-ii/how-the-us-navy-trained-its-pilots-in-wwii-the-bar-for-entry-was-high.html.

[50] Barrett Tillman, *On Wave and Wing: The 100-Year Quest to Perfect the Aircraft Carrier* (Washington, DC: Regnery History, 2017), 68.

[51] Ted St. Mane, *Lost Passenger Steamships of Lake Michigan* (Charleston, SC: The History Press, 2010); Ed L. Scharch, "NAS Glenview, Illinois: Carrier Qualification Training Unit (CQTU)," http://www.scharch.org/Ed_Scharch/09-nas-glenv-cqtu.htm; Nick Beadleston, "Yes, an Aircraft Carrier on the Grand Traverse Bay," *The Ticker* (Traverse City), February 18, 2015.

[52] "40,000 Landings on Lake Carrier," *Chicago Tribune* (Chicago, IL), August 29, 1944, 4; Goodspeed, "Lake Michigan's Naval Aviation History;" Ted St. Mane, *Lost Passenger Steamships of Lake Michigan*; "Navy Retires 2 Lake Flattops"; "U.S. Naval Air Station Glenview: The Final Salute, 1937- 1995," 10.

[53] "The Navy's Historic Aircraft Wrecks in Lake Michigan," Naval History and Heritage Command, published February 26, 2018, https://www.history.navy.mil/content/history/nhhc/research/underwater-archaeology/sites-and-projects/aircraft-wrecksites/aircraft-wrecks-in-lake-michigan.html

[54] Frank Sturdy, "Lake-Trained Pilots Rule Air in Marshalls," *Chicago Tribune*, February 23, 1944, 8.

[55] "Naval Aviation in WWII," (*Naval Aviation News*, November-December 1995), 27; "USS *Wolverine* (IX-64)," Naval History and Heritage Command, National Museum of the US Navy, https://www.history.navy.mil/content/history/museums/nmusn/explore/photography/ships-us/ships-us-w/uss-wolverine-ix-64.html; "USS *Wolverine* (IX-64)," NavSource Online: Service Ship Photo Archive (website), http://www.navsource.org/archives/09/46/46064.htm

[56] "Will Scrap Carrier," *Daily News* (New York, NY), October 25, 1948.

[57] *Heroes on Deck: World War II on Lake Michigan*. Directed by John Davies. Chicago, IL: John Davies Productions, and Moshman Productions, 2016. DVD; Michael Miner, "When World War II was Fought off the Coast of Chicago," *Chicago Reader* (website), May 23, 2016; Zak Koeske, "Documentary Explains How Lake Michigan Became an Aircraft Graveyard during World War II," *Chicago Tribune*, May 27, 2016.

[58] "The Aircraft Carrier Legacy of Lake Michigan," *The Sextant—Naval Heritage and History Command*, October 21, 2019, https://www.argunners.com/aircraft-carrier-legacy-lake-michigan/; "Museum Researching Local Aircraft Carriers," *The Ticker* (Traverse City), September 2, 2014; Nick Beadleston, "Yes, an Aircraft Carrier on the Grand Traverse Bay," *The Ticker* (Traverse City), February 18 2015; "Grand Traverse Lighthouse Museum Open New Exhibition," *Petoskey News*, May 26, 2015, https://www.petoskeynews.com/charlevoix/news/community/grand-traverse-lighthouse-museum-opennew-exhibition/article_d33c3635-f870-5efc-940c-0c674767295e.html; "Air Zoo to Restore Lake Michigan-Retrieved FM-2 Wildcat," *Warbird Digest*, August 17, 2013, http://warbirdsnews.com/warbird-restorations/air-zoo-restore-lake-michigan-retrieved-grumman-wildcat.html; Taras Lyssenko, "Lost in Lake Michigan: Resurrecting WWII aircraft," *Michigan History Chronicle*, 2021; "WWII Bomber Considered for Recovery," *Michigan History*, Vol. 104, No 2, March/April 2020, 9.i.; Steve Johnson, "'Heroes on Deck' Dives into WWII Naval Pilots' Training in Chicago," *Chicago Tribune*, May 25, 2016; "Restoration of WWII-era Plane Pulled from Lake Michigan Offers Pilot's Family Closure," *mLive* (website), August 1, 2019, https://www.mlive.com/news/kalamazoo/2019/08/restoration-of-wwii-era-plane-pulled-from-lake-michigan-offers-pilots-family-closure.html.

[59] "Air Zoo to Restore Lake Michigan-Retrieved FM-2 Wildcat," *Warbird Digest*, August 17, 2013, http://warbirdsnews.com/warbird-restorations/air-zoo-restore-lake-michigan-retrieved-grumman-wildcat.html.

[60] "The Aircraft Carrier Legacy of Lake Michigan," *The Sextant—Naval Heritage and History Command*, October 21, 2019, https://www.argunners.com/aircraft-carrier-legacy-lake-michigan/; "Night at the Museum," *AAA Living, Travel Ideas*, 2019, 39.

[61] Stephanie Staley & Amanda Wetzel, "Carriers in the bay: Lake Michigan aircraft carriers," *A Magazine of the Grand Traverse Lighthouse Museum*, 2016; "Grand Traverse Lighthouse: Facts and History," Grand Traverse Lighthouse Museum (website), 2020, https://www.grandtraverselighthouse.com/resources/facts-history/.

[62] "Lake Michigan's Call to Duty Exhibit," Michigan Maritime Museum (website), 2020, https://www.michiganmaritimemuseum.org/explore/exhibits/lake-michigans-call-to-duty/; "Lake Michigan's Call to Duty in WWII," YouTube video: Historical Geocaching with history buff tnphotobug, December 27, 2017.

[63] "USS *Wolverine*," Chicago Maritime Museum, https://www.chicagomaritimemuseum.org/uss-wolverine.html; "The Destination July 2018: Maritime Video," Chicago Maritime Museum, https://www.chicagomaritimemuseum.org/.