

WAKE ISLAND
(Wake Island National Historic Landmark)
(Peale Island)
(Wilkes Island)
(Wake Atoll)
Wake Island
US Minor Islands

HALS UM-1
HALS UM-1

HALS
UM-1

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

FIELD RECORDS

HISTORIC AMERICAN LANDSCAPES SURVEY
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HISTORIC AMERICAN LANDSCAPES SURVEY

WAKE ISLAND (Wake Island National Historic Landmark)

HALS No. UM-1

Location:

Wake Atoll is a small tropical coral atoll in the Pacific Ocean consisting of three islands (Peale, Wake, and Wilkes) enclosing the shallow, central lagoon and surrounded by a narrow fringing reef. From reef to reef, the atoll is approximately 5 miles long and 2.5 miles wide. At 19 degrees 17 minutes north latitude and 166 degrees 38 minutes east longitude, the atoll lies just west of the International Date Line. Wake Atoll is 2,458 miles west of Hawai'i, 1,591 miles east of Guam, and 691 miles north of Kwajalein in the Marshall Islands (Aaron 2008:1-1). (Refer to Figure 1).

Present Owner:

Wake Island is an unorganized, unincorporated territory (possession) of the United States, part of the United States Minor Outlying Islands, administered by the Office of Insular Affairs, U.S. Department of the Interior (Aaron 2008b and Aaron 2008: 1-1). Effective October 1, 2010, 611th Air Force in Alaska assumed management responsibility for the atoll. Previously, this responsibility was under 15th Air Wing (AW) of the U.S. Air Force (USAF) at Hickam AFB in Honolulu.

Present Occupant and Use:

Access to the island is managed by the U.S. Air Force (USAF), and the installation's day-to-day operations are managed by a base operations support (BOS) services contract. Pacific Air Forces (PACAF) currently maintains Wake Atoll for the benefit of other Department of Defense (DoD) services and various government agencies and other tenants. Some of the tenants include the U.S. Geological Survey (USGS), the Missile Defense Agency (MDA), National Oceanic and Atmospheric Administration (NOAA), Air Force Technical Applications Center (AFTAC), and the National Weather Service (NWS) (Aaron 2008: 1-1).

These tenants do not have permanent personnel stationed on Wake Atoll. The only personnel on Wake Atoll are military (Air Force) and BOS civilian contractors. During an MDA missile operation, the MDA deploys personnel to Wake Atoll for three to four weeks to support the mission. Government and BOS operations and activities are limited to Wake and Wilkes Island. There are minimal government activities and no human residents on Peale Island. The western portion of Wilkes Island is designated as a wildlife refuge, as there are more than 1 million birds on the island.

Significance:

The vast majority of historic properties at Wake Island Atoll are significant for their association with the theme of World War II (WWII) in the Pacific. The cultural resources that remain are symbolic of the initial American defense, subsequent Japanese take-over, the travails of the American prisoners of war, and the ultimate defeat of the Imperial Japanese forces. Due to its unique location, Wake Island played a vital link in twentieth century civilian and military transportation networks before and during WWII, and was the site of pivotal battles won and lost, making it a significant WWII battlefield. The successful ability of the small contingent of U.S. military personnel and civilians at Wake to initially repel Japanese air attacks and a naval invasion within the first few days of the war was a critical step for the United

States. Although defeated approximately two weeks later on December 23, 1941, when the Japanese eventually took over the island, this early small victory provided a tremendous boost to American morale in the face of great losses experienced at American installations in Hawai'i, Guam, and elsewhere. During the nearly four-year Japanese occupation of Wake, American forces bombed and shelled the island, with major sorties taking place during October of 1943 and August of 1945, until the Japanese eventually surrendered Wake Island to the United States on September 4, 1945.

The rise of commercial aviation in the 1930s in the Pacific, led by Pan American Airways, was important in helping to facilitate U.S. military development and expansion plans, specifically in the Western Pacific. Pan American Airways (PAA or Pan Am) played a critical part with its commercial development of Wake and Midway Islands. Wake Island was home to the Pan American Clipper (amphibious aircraft) which flew between the U.S. and Asia. To establish its transpacific operations, Pan Am constructed a seaplane base, along with other supporting facilities, in mid 1935 on Peale Island at Wake. Pan Am commenced its profitable transpacific airmail delivery service on November 22, 1935, and its transpacific passenger service nearly a year later on November 4, 1936. The commercial facilities that Pan Am built, along with U.S. development of Wake as a submarine and airbase in mid 1941 (after the Washington Naval Treaty expired in 1936), would later make important contributions to U.S. national defense in 1941.

The Japanese declared war on the U.S. with its attack on Pearl Harbor on December 7, 1941, and the same day in another time zone attempted to seize Wake Island. The small group of U.S. Marines and civilians at Wake successfully fended off the first invasion attempts, first by air on December 8 and then by sea three days later on December 11. The naval assault included thirteen Japanese vessels that were repelled by gunners on the island, who were successful at sinking two Japanese destroyers, three cruisers, one troop transport, and possibly a patrol boat as well. As many as 340 Japanese personnel aboard the ships may have been killed. The crippled Japanese fleet retreated to Kwajalein Island, making this the United States' first successful repulse of an amphibious landing by the Japanese, as well as the only time that coastal guns were able to drive off an amphibious landing during the War in the Pacific, and the first loss of Japanese naval vessels during WWII. This success in initially driving back Japanese forces so soon after the loss at Pearl Harbor became a symbol of hope for Americans and boosted morale in a time of dark despair. The initial repulse of the Japanese at Wake was important psychologically for a nation which had just been swept into war, as the small and under-supplied group of men at Wake was able to hold off the overwhelming Japanese forces against great odds. When the Japanese later captured Wake on December 23, 1941, the threat to their line of defense from Tokyo to the Marshall Islands was removed. National sentiment in the United States to get on with the war rose to a new pitch. "Remember Wake" and "Wake Up" were slogans that took a place beside "Remember Pearl Harbor" as inspirations to the American war effort.

The Department of the Interior designated Wake Atoll as a National Historic Landmark (NHL) in October 1985 in recognition of one of the nation's most significant historic resources associated with WWII in the Pacific and transpacific aviation prior to the war. The Wake Island Historic American Landscapes Survey (HALS) historical report documents the cultural resources and evolution of changes to the pre-war and WWII cultural landscape, with a focus on the establishment of the Pan American Airways seaplane base in 1935 and the U.S. Navy and Japanese occupations of the atoll throughout WWII. As a result, the historic period for the Wake cultural landscape is considered to be 1935-1945.

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PART I: HISTORICAL INFORMATION

A. Physical History

1. Date(s) of Establishment

Construction Dates:

1935 (Pan American Airways)
January 1941 to December 1941 (Contractors Pacific Naval Air Bases)
August 1941 to December 1941 (First Marine Defense Battalion)
December 23, 1941 to September 4, 1945 (Empire of Japan)
November 1945 to December 1946 (Pan American Airways)
1947 to 1958 (Civil Aeronautics Administration)
1958 to 1972 (Federal Aviation Administration)
1972 to 1994 (Pacific Air Forces Detachment 4, 15th Air Base Wing)
1994 to 2001 (United States Army)
2002 to present (United States Air Force)

2. Designer: Not known

3. Builder, Contractor, Laborers, Suppliers:

For Pan American Airways:

Contractor: Frank McKenzie (Cohen 1986: 6)
Laborers: U.S. civilians

For U.S. Military (1941):

Civilian Contractor and Laborers for the airfield and roads, dredging lagoon channel, water system and various buildings: Contractors Pacific Naval Air Bases (CPNAB); Prime Contractor: Morrison-Knudsen Co.
Military Laborers for island defense features: First Marine Defense Battalion (Cohen 1986: 4).

For Empire of Japan, Japanese Military:

Laborers: American prisoners of war (civilian contractors)

4. Original and Subsequent Owners, Occupants

Original Occupants: Short-term inhabitants/visitors from the Marshall Islands, pre-historic date unknown to the mid-1800s.

Subsequent Occupants:

Japanese feather hunters, c.1900-1910
Pan American Airways, 1935-1941; November 1945 to December 1946
U.S. Military: January 1941-December 1941; September 1945-present
Empire of Japan, December 23, 1941 to September 4, 1945

Present Owners: United States of America, January 17, 1899 to December 23, 1941; September 4, 1945 to present, with occupants including various branches of the U.S. military from 1941 to present.

5. Periods of Development

a. Original Plans and Construction

Prior to 1935, habitation of Wake Atoll was limited due to its remote location and lack of food and fresh water sources, other than rainfall. These factors discouraged settlement of the atoll by native Pacific populations (Keesing 1951). Natives from the Marshall Islands did visit the atoll; however, their visits were short due to the lack of fresh water. No evidence of prehistoric resources has been identified, although cultural resources resulting from historical use of Wake Atoll have been documented (Aaron 2008: 1-1).

In the first decade of the 1900s, Japanese bird poachers collected the feathers of sea birds for millinery purposes. They established two camps, one at the eastern end of Wilkes Island, where the Tanager Expedition in 1923 found a single wooden shack and a grave, and another, more extensive camp near the eastern end of Peale, where there were a few wood frame buildings, a tank and storehouse (www.janeresture.com/wake). No evidence of these features remains today.

Pan American Airways Development

The first permanent physical development of Wake was initiated by Pan American Airways when it sent a crew of men and supplies in the spring of 1935 aboard the SS *North Haven* from San Francisco to make preparations for their seaplane bases at Wake, Midway Island, and Guam. Veteran airport contractor Frank McKenzie was in charge of construction (Cohen 1983). Pan American's civilian construction crew commenced with the first, large scale changes to the landscape, particularly at Peale Island, where Pan Am stationed most of its facilities.

One of the first features constructed at the atoll was a short railroad across Wilkes Island. The railroad made it possible for cargo to be carried via a railway car from ships anchored off the oceanside of Wilkes to the inner lagoon, where it was then transported aboard a barge to the seaplane base site on Peale Island. In order to construct the railroad, workers had to hack through dense, dark green shrubs, some of which grew close together to a height of seven to ten feet and nearly impenetrable in places. The higher elevations had thick brush and scrub trees, with some having trunks up to a foot in diameter (Cressman 1995). Distant views in aerial photos of Wilkes Island during the 1935 to 1941 time period show a consistent, dense mass of vegetation covering the island indicating this construction had limited physical impact beyond its immediate location.

Plans or drawings for the initial base development on Peale were not located for this study; however a PAA drawing from July 1940 and U.S. Naval Air Station "Proposed Layout" drawing dated late 1940 indicate the existing Pan American Airways Base facilities at that time. Both maps are consistent with written descriptions of the earliest Pan Am facilities, and, along with limited photographs from the 1930s are the basis for this description of original site appearance and key features of the landscape.

Like Wilkes, Peale Island was densely vegetated. Prior to construction, the existing tree cover must have been thinned or completely cleared, and perhaps the ground leveled to some extent to

accommodate the buildings. Photographs of the Pan American complex between 1936 and 1940 depict an open canopy of the native *Tournefortia argentea* over a natural-looking coral and sparsely-vegetated ground surface. After constructing the Pan American Airways hotel, crews maintained a mowed lawn near the hotel and ornamental and garden plants were introduced to the landscape. Photographs from mid-1941 show that the majority of the island remained undeveloped and densely vegetated.

Drawings indicate that, in addition to the landing dock and shelter, the Pan Am base consisted of about two dozen buildings irregularly spaced within an area of about 26 acres on the central lagoon shoreline of Peale Island. Most of buildings, with the exception of the Pan Am Hotel, were relatively small, rectangular structures, less than 2,000 square feet building area. The Y-shaped hotel was set back from, and oriented toward, the lagoon, on the south side of the Pan Am complex, with the smaller support buildings loosely clustered to the north. Drawings from 1940 identify the following buildings within the complex: PAA hotel, airport office, crew and personnel quarters, airport managers' quarters, recreation building, domestic quarters, generator building, gas pump house, shop building, sick bay, warehouse, bunkhouse, and fresh water system structures. The initial PAA directional finder was about 500 feet north of the station, in the center of the island.

In order to prepare a suitable water landing area for its flying boats, five tons of dynamite were used to blast away many coral heads from within the lagoon. This blasting of coral was just the start of alterations to the lagoon, and later developments by the U.S. military necessitated further removal of even more coral heads.

b. Changes and Additions

U.S. Military Construction (CPNAB and the First Marine Defense Battalion)

The next major development period at Wake Atoll, following the initial Pan Am Airways base, was associated with the United States' military construction of a naval air base and submarine base to support its Pacific operations. In January of 1941, a work party of 80 men from the Morrison-Knudsen construction company unloaded supplies from the USS *William Ward Burrows* to begin a three year construction program at Wake, in preparation for the atoll's eventual military role.

Two Camps were built, both on Wake Island. Camp One was constructed on the west end of the southern arm of Wake Island near the Wilkes Channel, and originally served as the civilian contractors' living quarters, and later for the U.S. Marines. Camp Two, containing Base Headquarters and the main construction facilities (including housing for contractor personnel), was located on the west side of the northern arm of Wake, near the Peale Channel (Aaron, February 2008).

Some of the large scale changes to the landscape that took place during this time period just prior to World War II included changes to the ground surface at Wilkes and Wake Islands. One of the most notable was the ground disturbance on Wilkes Island when the submarine channel was initiated. In order to create the channel, earth and rock was dredged and left along the shores of the lagoon. This large scale excavation nearly bisected the island and made a permanent change to the landform at Wilkes, despite never having been completed or used for its intended purpose as a submarine pen due to the Japanese invasion. Another change to the landscape resulted from

the clearing and construction associated with the runway/airfield near the Wake apex. The Americans also built a group of above-ground igloo magazines east of the airfield. The Wilkes Channel, between Wilkes and Wake Islands, appears to have been dredged and modified by 1941 as part of the WWII construction build-up. The channel served as the entrance channel to the man-made boat basin. In addition, more coral heads were dredged from the lagoon fronting Wilkes in order to construct a channel to be used as a turning basin for seaplanes.

By mid-1941, the construction of the Naval Air Station (NAS) was well underway on Peale Island, including the addition of a seaplane ramp and large parking apron, and construction of several structures with concrete foundations. While early layout plans for the NAS indicated the Navy's intent to construct facilities across the entire island, the initial phase concentrated development immediately north of the Pan Am complex, extending across the island from the lagoon to the ocean shores. A 1940 layout plan depicts a bridge between Peale and Wake Island, however it is unclear whether it was an existing or proposed structure.

The first contingent of the 1st Marine Defense Battalion arrived at Wake on August 19, 1941. They set-up defense stations (part of the coast defense group) at Wake, which included three gun batteries (one on each island, Batteries A, B, and L) and a battalion headquarters (Cohen 1983).

Japanese Military Construction

The most significant changes to the landscape throughout Wake Atoll occurred with the Japanese occupation period during WWII. After taking control of the atoll in December 1941, the Japanese commenced with constructing substantial defense fortifications, in order to protect defensive forces from U.S. military attempts to reoccupy the island. The primary source documentations of remaining Japanese fortifications at the end of the war are the United States Strategic Bombing Survey conducted in 1945 (cite, 1945) and the map of Wake Island produced by the Army Map Service in 1945. (Refer to Figure 5).

In addition to Japanese bomb strikes taking their toll on both the landscape and the lagoon environments, Japanese defense construction efforts further modified the ground surface of the atoll. This included such features as large anti-tank ditches; linear embankments; coral-lined trenches and rifle pits; depressions and revetted structures; concealed emplacements, and coral mounds – all of which required the displacement of earth and vegetation. Many of these features were located roughly parallel to the beaches, especially those that were likely landing sites. The Japanese also constructed numerous above-ground structures, such as concrete blockhouses, bunkers and pillboxes, often covered with mounds of coral rubble and sand; as well as support buildings and structures for housing, operations, storage, and utilities.

There was a very limited road network at the time the Japanese landed on the island, but by the end of the war they had created an expanded network of main roads, secondary roads, and trails across all of Wake Island. The Japanese widened and lengthened the U.S.-built runway on the eastern side of the south arm of Wake Island (Runway A) and built two additional runways, which intersected Runway A in the southeast corner of Wake Island. In addition, the Japanese retained and developed the Pan Am and NAS road system on the island, and expanded roads into previously undeveloped areas. They also constructed a coral-cement causeway between Peale and Wake Islands.

Post WWII Construction

After the Japanese surrendered to American Forces at Wake in September of 1945, the American-led build-up efforts resumed. Pan American and U.S. military interests fueled redevelopment of the atoll for both commercial and military land-plane use. The atoll's landform today reflects extensive grading for post-war reconstruction and subsequent developments, as well as natural landform changes resulting from storm waves, sea surges, and typhoons. Most of the changes to the landscape at Wake occurred right after the war, and continued until the early 1970s, when the Coast Guard station, the FAA, and Pan American Airways ceased their operations at Wake. Civil and administrative control of Wake Island was then given to the United States Air Force.

The island most affected was Wake, with large areas having been leveled and filled for construction of CAA (Civil Aeronautics Administration) facilities and the extension of the runway. Many of the roads built at Wake Island during the WWII period were replaced with a new network of asphalt paved roads created to serve the new development clusters, such as the "downtown" area in the north, the industrial area in the center of the island, the former FAA housing area on the east coast, and the missile launch activity on Peacock Point. At Peale Island, a steel and plank bridge was built at one point, after the original American built bridge and the Japanese built coral-cement causeway collapsed. Much of the vegetation that once existed at Peale prior to its development in the 1930s and 1940s has now returned, due to inactive use of the island. A causeway with a two-lane asphalt road was built by the Navy Seabees in 1946 and connects Wilkes and Wake Islands. This solid-fill causeway enclosed the lagoon edge of the boat basin and Wilkes Channel, permanently closing-off the only natural opening from the ocean to the lagoon. Today the channel and boat basin edges are hardened with wharves and steel and/or concrete revetments.

B. Historical Context

1. Prior to 1930

There is no archaeological evidence of pre-European (prior to the year 1568) human occupation of Wake Atoll (Wake, Wilkes, and Peale Islets, along with the coral reef and central lagoon); however other types of evidence suggest that the atoll was visited by voyagers from the nearby Marshall Islands. For example, according to a Marshallese tradition, young men hoping to become warriors ate the *kio* flower, found only on Wake Atoll, which the Marshallese people called *Eneen-kio* or *Enen-kio* (“Island of the orange flower”). This ritual of obtaining and consuming the orange colored flower proved a man capable in his abilities as both a navigator and a warrior, successfully allowing him to pass his initiation ceremonies (Jackson 1996).

Additionally, according to the 1996 Historic Preservation Plan for Wake Island Airfield, Wake Island:

Heine and Anderson (1971) also suggest that Marshallese voyaged to Eneen-kio to obtain wing bones of large seabirds which were used for tattooing chiefs. Spennemann (1991:9-10) has reviewed Marshallese traditional accounts of voyages to Eneen-kio. Stories of such trips are few, but origins from Lae, Namorik, and Bikini are cited (Jackson 1996).

An important part of the ancient religion of the Marshallese was tattooing. The chiefs were tattooed all over their bodies, including their faces. The tattooing was a matter of great ceremony, and always took place on certain islands—Ailinglaplap in the Western Chain and Aur Atoll in the Eastern Chain. Human bones were necessary, as they were strong enough and capable of being sharpened for use in the tattooing process. It was also felt that through the sacrifices of others they were also sharing the pain of the chief who was being tattooed. The only way a man could save himself was to obtain an equally strong bone as a substitute for his own, and the only bone that was acceptable was the wing bone of a very large sea bird found at Enen-kio, possibly what is known as the albatross or “gooney bird.” Thus it is the fear of human sacrifice that motivated men to undertake the long and treacherous journey to Enen-kio. It is believed that the last voyage of Marshallese to the island was in the mid-eighteen hundreds, since the first Christian missionaries arrived (in the Marshall Islands) in 1857 (Heine and Anderson 1971).

The first documented account of Wake Atoll took place when Spanish explorer Alvaro de Mendana discovered it on the eve of the Feast of St. Francis, October 2, 1568, and thus named it “San Francisco” and declared it a territory of Spain. “San Francisco” was chosen in honor of Saint Francis of Assisi, who Mendana believed had safely guided them through their rough journey to the island. The expedition does not report the sighting of any inhabitants and due to the lack of water and its remote location, the atoll was relatively forgotten for the next 200 years.

The Polynesian rat (*Rattus exulans*) was reported on the island by the American Wilkes expedition in 1841, and may have also been described by the earlier Mendana expedition in 1568 as well. This further supports the theory of pre-historic Marshallese visits to the atoll, as the rat could have arrived on canoes originating in the Marshall Islands and deliberately introduced as a food source (Jackson 1996).

In the eighteenth century, the rapid development of the China trade, of the Pacific whaling industry, and of the northwest American and Siberian fur trade meant that an increasing number of vessels

plied the waters of the Central Northern Pacific during this time. The rediscovery of Wake is usually credited to Captain William Wake of the British trading schooner *Prince William Henry*, en route from Port Jackson, Australia to Canton in China in 1792. But according to other sources the discoverer was British merchantman's skipper Samuel Wake aboard the *Prince William Henry* in 1796, who then named the largest of the three islands after himself. Although he did not set foot on the island nor did he claim it as British property, Samuel Wake conducted a hasty survey from the deck of his ship. Not long after the *Prince William Henry* departed, a second British schooner, the fur trading vessel the *Halcyon*, arrived at Wake. Thinking himself the discoverer, the vessel's master (Captain Charles William Barkley) named the atoll in honor of his ship (Urwin 2002).

In lecturer/explorer/author/editor and scientific supporter J.N. Reynold's 1828 report to the U.S. House of Representatives, while captaining the *Bellona* in 1823, American Capt. Edward Gardner's discovery of a 25-mile (40 km) long island with a reef at the eastern edge, may have been Wake Island. However, the first official visit by Americans took place in 1841 aboard the sloop-of-war (small sailing warship) USS *Vincennes*, when the *United States Exploring Expedition*, on a U.S. sanctioned mission to accurately survey the location of South Pacific islands reported over the years by whalers and others, landed on the islands. The expedition was under the command of U.S. Navy Lt. Charles Wilkes, and civilian naturalist Titian Ramsey Peale, one of a nine-man Scientific Corps, who was also a member of the expeditionary party (Urwin 2002). It is for these men, Wilkes and Peale, that the remaining two islands are named. The Wilkes and Peale names were formally recognized 82 years later, during a U.S. Biological Survey and Bishop Museum sponsored scientific expedition aboard the USS *Tanager* in 1923.

In the 1840s, bird guano became a prized international commodity as a source of agricultural fertilizer and saltpeter for gunpowder. In 1855, the U.S. learned of guano deposits on islands in the Pacific and in 1856 Congress passed federal legislation in the form of the Guano Islands Act to take advantage of these deposits. The act allows U.S. citizens to take possession of islands containing guano deposits. The islands can be located anywhere, so long as they are not occupied, not within the jurisdiction of other governments, and a concession was applied for. Following passage of the act, a great deal of exploration took place in the Pacific. Although some sources claim that Wake was exploited by guano collectors, the list of over 50 islands which concessions were actually applied for does not include Wake Atoll (Spennemann 2005).

The next documented account of human contact at Wake Atoll took place in 1866, when the German ship *Libelle*, bound for Hong Kong from San Francisco having last stopped in Honolulu, shipwrecked on the atoll's coral reef. The ship's passengers were stranded on the atoll for approximately three weeks, before setting off in two small boats for help. Only one of the two boats, reportedly carrying opera singer Madame Anna Bishop, made it safely to Guam; the other boat and its passengers, which included Captain Tobias of the *Libelle*, was never found (Urwin 2002).

About 30 years later, during the Spanish-American War, Major General Francis V. Greene, USN, commanding the Second Detachment, Philippine Expeditionary Force, en route to the Philippines, stopped at Wake Atoll. An American flag was raised on shore on July 4, 1898 and Commander Greene declared the atoll as property of the United States. Sidestepping protocol by not securing permission from his superiors before his declaration, his actions were considered unofficial. Even U.S. President McKinley refused to confirm press reports of the island's "seizure" (Urwin 2002). However, formal possession by the United States took place when the USS *Bennington*, led by Commander Edward D. Taussig, sailed to Wake Atoll. Authority was given to Commander Taussig

from Washington D.C., and the United States' claim of Wake Atoll was made during an official ceremony conducted onshore on January 17, 1899.

Despite its obscurity, several ships and expeditions made stops at Wake, including one in December, 1906 when U.S. Army General John J. Pershing, later commander of the AEF (American Expeditionary Force) in World War I, was traveling westbound on an Army transport on his way to an assignment in the Philippines (Cohen 1983). Pershing left a cache of emergency supplies at Wake for possible future shipwreck survivors.

It is likely that during the time of Pershing's visit, or shortly thereafter, Japanese feather hunters helped themselves to the emergency rations and supplies. These Japanese entrepreneurs, collecting feathers for the French millinery trade, established semi-permanent bases on Wake, the first people to purposefully reside there for any length of time. Feathered caps for women were a popular fashion around the turn of the century, and Wake Atoll's abundant bird population would have provided an ample supply of feathers. Japanese poachers were seen on Wake in 1902, 1904, and 1906 and were apparently still, or again, on the island in 1908 (Spennemann 1998). Two Japanese campsites (one on Wake Island and one on Peale Island) and a shrine on Wilkes Island, along with numerous layers of bird bones (suggesting that the feather hunters were there for at least several months) at the campsites and other domestic artifacts and tools related to the skinning of birds, were reported by the scientific expedition of the USS *Tanager*, which stayed for two weeks on the atoll in 1923. It is documented that Japanese feather hunters were also active on other Pacific islands, including Midway, Laysan, and Lisianski, around the same time (Aaron, February 2008). The remains of a Japanese birding camp and the shrine were being shown to tourists by Pan American Airways personnel as late as 1937 (Kaucher 1947).

The expedition in 1923 by the USS *Tanager*, a joint effort between the U.S. Biological Survey and the Bernice P. Bishop Museum in Honolulu, Hawai'i, formally recognized Wilkes and Peale Islands and the expedition's explorers found and documented the shelter and religious sites of the Japanese feather hunters who lived on the atoll approximately 15 years earlier. The expedition originally intended to collect bird and other animal, plant, and coral specimens from the various islands within the Northwestern Hawaiian Islands Bird Reservation. However, the expedition sponsors managed to convince the U.S. Navy to provide support for an expansion of the study area to include Wake and Johnson Islands, offering to provide the Navy with information about these Pacific outposts which potentially held strategic military value (Aaron, February 2008).

2. 1930-1941 Pan American Airways

By the mid-1930s the prospect of war between the United States and Japan was becoming a probability in the minds of American military planners, and as early as 1916 the U.S. Navy was considering the possibility of a Pacific war with Japan. Japan had been expanding its Pacific power base throughout the late 1800s, and by the year 1900 it controlled the Kurile Islands, part of Sakhalin, and Japan was in occupation of Formosa, the Bonin Islands, and the Pescadores. The Naval Appropriations Bill of 1916 created the Helm Commission, which was responsible for determining the Navy's strategic position throughout the world. The Helm Commission worked under the premise that sooner or later the U.S. would grant independence to the Philippines, and without its presence in Manila, the United States would lose its military stance in the Pacific. Guam, the second westernmost American possession, was logically the next best site, and therefore the Helm Commission recommended development of Guam into a major fleet base. However the First World War erupted and monies were instead appropriated towards that effort (Urwin 2002).

In 1921 the Washington Naval Conference was held, in an attempt to reduce the number of military bases and control the growth of the world's navies. The resulting Washington Naval Treaty was struck on February 5, 1922, which was an agreement between the United States, Great Britain, and Japan, to stop all military building on Pacific Islands west of the Hawaiian Islands. The treaty, which would expire in December of 1936, effectively eliminated any chances of the U.S. conducting offensive naval warfare in the Western Pacific. Regardless, the U.S. Navy began actively considering Wake Atoll as a potential base to support the American Pacific fleet (Urwin 2002).

Around this same time, two airline companies, South Seas Commercial Company and Pan American Airways (Pan Am), were seeking rights and leases to various Pacific islands to develop pioneering trans-Pacific air services. Throughout the early 1930s, Juan Trippe, president of Pan Am, was in negotiations to try and secure landing rights for his airline for a trans-Atlantic ocean crossing; however the British blocked Pan Am at every turn. Having invested millions of dollars in ocean-crossing clippers, Trippe announced in 1934 that Pan Am would fly the Pacific Ocean. Clippers making the long trip to China could stop to refuel at Midway, Wake, and Guam. Securing the landing rights to these islands would not be difficult, as the route from San Francisco to China was controlled by the United States (Jackson 1996).

The impact of Trippe's decision resounded all the way to Washington, D.C. Within days, the Navy was calculating what a commercial air route to China would mean to Pacific military strategy. The answer was obvious that the refueling bases would be of great military value. It meant that fortification of the Pacific would begin (Jackson 1996).

In October of 1934, Trippe officially communicated with the U.S. Navy about Pan Am's plans and requested a five year lease of Wake Atoll. Pan Am would fly a route from San Francisco through Hawai'i, Midway, Wake, Guam, and the Philippines en route to China. The airlines would build settlements on the desert islands of Midway and Wake as well as service communication facilities on all of the other islands. Trippe also offered the return of control of the bases to the Navy if it became necessary (Jackson 1996).

President Roosevelt signed an executive order (Executive Order No. 6935) in December, 1934, placing Wake under the administrative control of the Navy. In turn the Navy leased space at Pearl Harbor, Midway, Wake, and Guam to Pan American Airways. In May of 1935, construction materials were off-loaded at Wake Island in preparation for the Pan Am seaplane base to be built. In September of that year, a survey party attached to the USS *Nitro* visited Wake Atoll and reported to the Chief of Naval Operations that the island had military potential and was suitable as a location for a seaplane and submarine base. Members of the party inscribed "U.S.S. Nitro" and "3-9-35" on a coral boulder, which can still be seen today, located on the lagoon shore of Wilkes Island (Jackson 1996).

Development of the Pacific Islands in 1935 for commercial aviation provided much needed civilian work relief assistance for those in need of jobs, as the world was in the midst of the Great Depression. Wilkes Island was the proposed location for the Pan American Airways seaplane base, but early construction crews learned that the island was subject to inundation and therefore, Peale Island was selected as a permanent base location because it offered more shelter from the ocean. However, the south shores of Wilkes and Wake Islands were far better suited for off-loading supplies from ships because the areas offered better anchorage. Materials were loaded from barges at the Wake/Wilkes channel, transported across the island on marine railroad to the lagoon, and then transported across

the lagoon to Peale (URS Corporation 2002). Pan Am built a single-story hotel, a landing dock, crew and personnel quarters, shops, communication and utility facilities, and other buildings and structures to support its twice-weekly flight service.

Except for the landing pier, Pan Am developed complete identical establishments on Midway and Wake, including a single-story luxury hotel, stores, a power plant, radio station, refrigeration unit, rainwater catchment system, and living quarters for the ground crews. Even an attempt to hydroponically grow vegetables (such as lettuce, tomatoes, squash, and beans) was made in the late 1930s on Wake (Aaron, January 2008).

Pan Am received a lucrative contract from the U.S. Post Office to carry airmail to the Far East, and their first transpacific airmail flight took place on November 22, 1935, leaving from San Francisco and arriving in Manila 6 days later, using the Martin M-130 "China Clipper." On October 21, 1936, Pan Am initiated regular weekly six-day passenger service between San Francisco and Manila. On November 4, 1936, the arrival of the Clipper at Alameda, California completed the first regular roundtrip passenger flight to Manila, and on April 28, 1937, a Pan American Clipper arrived in Hong Kong (Aaron, January 2008).

Even though stymied by the earlier Washington Naval Treaty, the United States remained aware of the importance of developing and using its western Pacific holdings to fortify itself against the possibility of a military naval attack by the Empire of Japan. Therefore the rise of commercial aviation in the 1930s in the Pacific played a very large part in helping to facilitate U.S. military development and expansion plans in the Western Pacific.

In the late 1930s, American military planners became increasingly aware of the strategic value of the nation's military outposts in the Pacific and began formulating a series of strategies for countering potential aggressors, each aggressor being designated by a different color (Cohen 1983). Japan, an obvious aggressor in the Pacific, was given the code name "orange." And then as global conflict flared, a new plan for the Pacific was introduced. This new plan combined the different color-coded strategies into one plan, titled "Rainbow 5." This plan called for the American Pacific Fleet, in the event of war, to sail to the west, capture the Japanese mandated islands, and secure supply lines to the Philippines. A number of small island possessions of the U.S., including Wake, would be considered forward bases and act as a ring to seal off the Hawaiian Islands from attack. Besides Wake, this ring was to include Johnston, Palmyra, Samoa, and Midway Islands (Cohen 1983).

In 1938, in preparation for defending the Hawaiian Islands against the Japanese, a group of Naval Officers appointed to study naval policies recommended that \$7.5 million be allocated to Wake to develop the Atoll as a submarine and air base. The Navy's Hepburn Board recommended the development of a submarine base at Wake Island as among the projects slated "for earliest completion." Official legislation authorizing funds for the development was signed into law on April 25, 1939, with \$2 million of it slated for construction of the Naval Air Station. However the final appropriations bill failed to include funding for the Wake Island Naval Air Station. Monies for naval developments at Wake were eventually approved the following year under the 1940 appropriations act (Jackson 1996), and beginning in January of 1941 the first Navy and contractor personnel arrived at Wake Island to begin fortifying the island and establishing a naval air base. Not until the summer of 1941 did the military finally supplement the Pan Am facilities when a crew of civilian employees working for the Morrison-Knudsen Company arrived and began construction of the facilities (Aaron, January 2008).

3. 1941 United States Construction

In January of 1941, the construction of the submarine and air base had begun at the hands of a consortium of firms called "Contractors Pacific Naval Air Bases," specifically Morrison-Knudsen (Jackson 1996). A pioneer work party of 80 men unloaded supplies from the USS *William Ward Burrows* at Wake to start construction on the atoll. Eventually about 1,200 men worked for Morrison-Knudsen, the prime contractor, whose operations on the island were headed by Dan Teters (Cohen 1983). The construction program was intended to last three years and would prepare the island for its eventual military role. The civilian construction workers began the tasks of building the airfield and a seaplane base, in addition to building the road system, dredging a channel in the lagoon, constructing a water system, and building their own living quarters. Eventually a submarine base and all support facilities were planned to be built as well (Cohen 1983).

As Wake's construction busily carried on, Admiral Husband Kimmel, the Commander-in-Chief of the Pacific Fleet, recommended that troops should be stationed at Wake to protect the island. Kimmel urged Admiral Harold R. Stark, the Chief of Naval Operations, to send troops but it wasn't until August of 1941 that a small contingent of the First Marine Defense Battalion arrived on the island (Cohen 1983).

The First Marine Defense Battalion, led by Major James P.S. Devereaux, began to arrive. Tasked with constructing defensive positions and garrisoning the atoll, the marines prepared the coastal defense systems but were often called away from their official duties to assist with loading or unloading visiting ships or they were helping to refuel aircraft (B-17 Bombers on their way west). As a result, the island's defense preparations suffered and the Marines, who were working seven days a week, 12 to 16 hours a day, had no time for gunnery training. Occasionally the civilians helped the Marines, but their priority was to fulfill their construction contracts (Cohen 1983). They set up Camp One for the Marines on Wake Island near the Wilkes Channel. They were joined later that fall by the VMF-211 Marine attack air squadron, headed up by Major Paul Putnam.

A small Naval (58-man) and an Army detachment (one officer and five men) also arrived to prepare the seaplane base and establish radio communications with B-17s that were flying to the Philippines (Cohen 1983). Navy Commander W.S. Cunningham, who was in overall command of Wake, arrived in 1941 and set up Base Headquarters and the main construction facilities at Camp Two near the Peale Channel, where contractor personnel were housed. The contractors, along with Pan Am, had created support facilities including a hospital, barracks, shops and other buildings in Camp Two. Due to its size, Wake had a limited carrying capacity and by the fall of 1941 the total population of Wake had grown to 1,732, consisting of over 1,200 civilians working on general construction and approximately 500 service personnel (only one quarter of the intended military contingent) working on the garrison (Aaron, February 2008).

4. 1941-1945 Japanese Occupation Period

Sunday, December 7, 1941, was a much needed day off for Wake's military personnel, who had been working long hours preparing Wake's defenses. On the other side of the international dateline in Hawai'i, it was Saturday, December 6th. It wasn't until the morning of Monday, December 8th that the surprise Japanese attack on Pearl Harbor was reported at Wake. The Japanese opening attack of Wake came swiftly by air at 11:58 am (local time) on December 8, 1941, carried out by 36 bombers from Air Attack Force #1, 24th Air Flotilla who had arrived from bases in the Marshall Islands. No

radar was in use at Wake at the time, so defenders had to rely on visual contact to detect approaching aircraft.

Despite the earlier preparations, none of the military or civilian built defense installations were completed sufficiently enough by that time to meet a surprise Japanese attack, with the naval air station estimated to have been only 65 percent finished by the time of the attack (Urwin 2002). The atoll's defenses included three artillery batteries, each with two 5-inch guns; three anti-aircraft batteries, each with four 3-inch guns; eighteen 50-caliber machine guns; and thirty 30-caliber machine guns, with an insufficient amount of military personnel to operate all of the weapons.

A Marine Corps contingent of twelve Grumman F4F-3 Wildcat fighters had arrived just days before the attack, and eight of them that were parked on the airstrip that morning were destroyed. The other four fighters were on patrol and were able to assist in defending the island. The M-130 Pan American Airways *Philippine Clipper*, which had been floating in the lagoon at the time of the first air raid, survived the attack and evacuated Pan Am staff, leaving their Chamorro staff behind. Camp One was burned out, and many structures in Camp Two were damaged or destroyed (Aaron, February 2008), with the Pan American facilities completely destroyed (Urwin 2002).

With construction efforts now halted, civilian contractors worked at strengthening defenses and protecting the remaining aircraft. Many of the contractors volunteered to fight alongside the Marines, as the Japanese commenced their daily air raids of Wake, flying in from their base at Roi (Roi-Namur) in the Marshall Islands (Cressman 1995).

Three days later on December 11, Japanese forces attempted a naval assault on Wake Island. Thirteen Japanese vessels closed on the atoll, but were repelled by gunners on the island, who were successful at sinking two Japanese destroyers, three cruisers, one troop transport, and possibly a patrol boat as well. As many as 340 Japanese personnel aboard the ships may have been killed. The crippled Japanese naval assault fleet retreated to Kwajalein, making this the first successful repulse of an amphibious landing by either side during the War in the Pacific, and the first loss of Japanese naval vessels during World War II (Cressman 1995). This victory had an enormous effect on the nation, as it was the first good war news to come out of the Pacific and the first indication that American forces could stop the Japanese.

It was a short-lived reprieve, as Japanese naval air forces returned and spent 11 days bombarding Wake Island. In the meantime the U.S. Navy coordinated and sent a rescue force to assist at Wake, only to decide at the last minute to abandon that effort due to multiple concerns, such as the possibility that Wake had already fallen, that they were possibly headed into a Japanese trap, and the need to retain ships to defend the Hawaiian Islands (Jackson 1996). And so on December 23, 1941, after some six hours of combat and after hearing that no additional relief would be coming from Pearl Harbor, Commander W.S. Cunningham surrendered Wake Island to the Japanese. The Japanese took approximately 1,600 prisoners of war (POWs), 450 of whom were military personnel. The American POWs were sent to Japanese prison camps, mostly in China but some in Japan. Of these 1,600, 360 were retained by the Japanese to work as forced laborers for the Japanese. In September, 1942, all were removed from the island except for ninety-eight of the prisoners (all civilian heavy equipment operators, except for one doctor) who were kept on Wake to assist the Japanese in developing their defensive positions on the atoll. Under orders from the Imperial Japanese Navy Commander, Admiral Sakaibara, the American POWs were executed on the shore of Wake Island on October 7, 1943. The memory of their sacrifice is sustained by the inscription on "POW Rock" on Wilkes Island (Aaron, February 2008).

During their almost 4-year occupation of Wake, the Japanese constructed elaborate shoreline defenses, developing the island's defenses much more than at their other bases in the Marshall Islands. Large tank traps were constructed on the entire periphery of the island, along with a series of slit trenches and rifle pits. Pillboxes, barbed wire, landmines, revetments, command posts, anti-aircraft fire control centers, shelters and magazines were all built, and all were connected by telephone line to Admiral Sakaibara's three-level command center.

From 1941 to 1945, the Japanese stationed as many as 4,000 troops on the atoll at any given time, and they continued their development of Wake Island unabated until June of 1943. In July of 1943, American bombers, who had begun bombing and shelling Wake since February of 1942, attacked Japanese coastal defense positions, and in October carrier-based aircraft of Task Force 14 flew 510 sorties against the atoll, and fleet units bombarded the island with 5- and 8-inch shells. This resulted in the loss of 300-400 Japanese personnel and the destruction of an estimated 90 percent of buildings on the atoll (Jackson 1996).

By December 1943, Japanese air capability on Wake had been destroyed and Japanese shipping was cut off, with resupply arriving via submarine. With the American blockade effectively ceasing further build-up, the Japanese were also faced with food shortages and suffered the effects of malnutrition and starvation (Aaron, February 2008). By mid-1944, devastation of the troops and facilities and infrastructure on the atoll was so severe that American Commanders determined that air and naval blockade of the island would be adequate to neutralize the Japanese. On August 13, 1945, six Marine planes conducted the last attack on Japanese positions on Wake, and on September 4, 1945, Admiral Sakaibara surrendered Wake Island to the United States (Aaron, January 2008).

5. 1945-1947 85th Naval Construction Battalion, end of Navy Administration

Following World War II, the Navy retained administrative control of Wake Island until 1947, when it turned the island over to the Civil Aeronautics Administration (CAA). The Navy still held official ownership of the land, and Pan Am (under the CAA) operated and administered the majority of the aviation facilities (Aaron, January 2008). Spurred on by the increased optimism and enthusiasm for airline travel following the war, Pan Am sought to re-establish its exclusively international prewar network and returned to Wake in November of 1945 with a team of engineers to survey and assess the need for a regular commercial airline route (Aaron 2008). This spawned economic development and growth on the island.

The Navy signed a revocable lease agreement and permit with Pan American Airways, Inc. in March of 1946, and after a few unexpected start delays, due to an aircraft shortage and then communication facility problems, passenger service resumed on a regular basis beginning in December, 1946. From this time forward the new airstrip on Wake Island was used, as Pan Am did not reestablish its water landing facilities on Peale Island (Aaron, January 2008).

6. 1947-1952 Post-war, CAA, and the Korean Airlift

From 1947-1952, the Civil Aeronautics Administration (CAA) began the planning and implementation of facility upgrades at Wake and Pacific Island airfields. The CAA was an offshoot of the Civil Aeronautics Authority, the federal agency created as a result of the Civil Aeronautics Act of 1938. The original Civil Aeronautics Authority was responsible for conducting accident investigations and regulating airline fares and determining routes individual carriers served. In 1940,

President Roosevelt split the Civil Aeronautics Authority into two agencies—CAA (under the Department of Commerce) and the Civil Aeronautics Board (CAB). This new CAA was responsible for air traffic control, airman and aircraft certification, safety enforcement, and airway development, which included development of airways and facility upgrades at Wake Island.

Transocean Air Lines also began operations based out of Wake Island and other airlines, such as British Overseas Airline Corporation and Philippine Airlines, occasionally flew in and out. In June of 1950, the United States entered into a war against North Korea, and Wake Island took on new importance because of its strategic mid-Pacific location. In July, the airlift of men, supplies and goods to the Korean front began. By September of that year, 120 aircraft were passing through Wake per day (Aaron, January 2008).

On October 15, 1950, President Harry S. Truman and General Douglas MacArthur met for one day at Wake Island for a brief conference regarding strategy for the Korean War, the first and only time the two men would meet in person (Aaron, January 2008). Although the building that housed the meeting is no longer extant, a commemorative plaque has been placed on a nearby building (Building 1601) by the National Park Service.

7. 1952-1972 Typhoon Olive, MATS Operations, and the FAA

After Typhoon Olive destroyed 85-90 percent of the buildings at Wake on September 16, 1952, the CAA allocated \$10 million for the “Rehabilitation of Wake.” New family housing (at Heel Point) was either built or rebuilt during 1952 and 1953, and maintenance shops and warehouses, a dining hall, dormitories, infrastructure, and recreational facilities continued to be built throughout the 1950s and 1960s (Aaron, January 2008).

Even the U.S. Air Force, created as a separate service from the U.S. Army Air Corps (USAAC) in 1947, was interested in Wake Island for its Military Air Transport Service (MATS). MATS was established to support the new Department of Defense, with responsibility for its support falling to the USAF. In November, 1952, the USAF conducted a study of its own to justify expenditures of approximately \$1.5 million for construction of military installations on Wake Island. The proposed construction was tied in with a proposed \$10 million rehabilitation program on the island by the CAA. Many abandoned military structures were demolished to make room for MATS transient and permanent housing (URS Corporation 2002).

During 1953, more than 85 percent of aircraft traffic through Wake was military or civilian contract carriers supporting the Korean involvement. Due to rugged terrain and poorly maintained roads in Korea, airdrop became the primary means of supplying troops with essential supplies. Air transport was also used for evacuating the injured from field hospitals, saving thousands of lives (Aaron, January 2008).

For the 20 years following Typhoon Olive in 1952, Wake Island experienced a population boom and the most significant period of building and construction occurred. The population grew from 349 in 1950 to 1,097 in 1960, and to 1,650 in 1970. This was due to the increased daily air traffic through Wake to and from Guam, Korea, Vietnam, and other Pacific Rim locations. By 1959, a total of 10,554 flights per year had been routed through Wake, including 27 weekly passenger-carrying commercial airline flights (Aaron, January 2008).

During the Vietnam Conflict of the early 1960s, Wake Island proved again to be strategically important for airlift operations during U.S. military aid to the government of South Vietnam. In 1962, jurisdiction of Wake Island was transferred from the U.S. Navy Department to the U.S. Department of the Interior. Through Executive Order 11048, issued September 4, 1962, “the basic island responsibility for Wake’s civil administration was transferred from the Navy to the Department of the Interior.” At the same time, the Secretary of the Interior and the FAA (Federal Aviation Agency) Administrator entered into an agreement that provided for all executive, legislative, and judicial authorities to be exercised by persons designated by the FAA Administrator. The FAA had been created from passage of the Federal Aviation Act of 1958 due to the need for an independent federal aviation agency to provide for the safe and efficient use of national airspace. The functions of the then twenty-year-old CAA were transferred to the new FAA, which was now responsible for civil aviation safety. The FAA would change its name one more time, in April of 1967, when the agency was placed under the newly-created federal Department of Transportation (DOT), which was responsible for developing and carrying out comprehensive transportation policies and programs across all transportation modes. With the creation of the DOT in April 1967, the FAA became and continues to this day to be known as the Federal Aviation Administration (Federal Aviation Administration).

Thus, the Wake Island Code (Federal Aviation Regulations, Part 165) was issued as part of FAA regulations and it provided the necessary regulations and procedures for administering the island. The FAA was charged with performing secondary functions to their primary function of air traffic control and airport operations, including a range of services needed to maintain a small municipality.

On September 16, 1967, Typhoon Sarah caused \$5 million in damages to Wake Island. Approximately 95 percent of island buildings were damaged and half of the FAA employee housing was destroyed, requiring the evacuation of one quarter of the island’s population. Following the typhoon, a new taxiway parallel to the runway was completed in 1968 and the last of the damaged employee houses was replaced in 1970.

In 1969, Wake was included in the United Service Organizations (USO) entertainment circuit, and celebrities such as Bob Hope, Anita Bryant and Miss USA visited the island as part of a USO tour. By 1970 the population on the island was 1,650, down slightly from 1,831 in 1966, and various tenant organizations had taken up residence on the island to support operations there. The largest employer was the Facilities Management Corporation (FMC), with the second largest employer being the FAA. The FMC was a contractor for the Military Airlift Command (MAC), which had replaced the MATS in 1965.

In the early 1970s, civil and military aviation waned. Higher efficiency, large transport jet aircraft with greater airlift and longer-range capabilities lessened the need for Wake Island Airfield (WIA) as a refueling stop. This, along with the tapering off of U.S. military air support operations in the Far East, was the beginning of the decline of Wake Island’s aviation and social heyday (Aaron, January 2008).

The final scheduled Pan Am passenger flight out through Wake Island took place in June, 1972, and the last scheduled Pan Am cargo flight took place the following month, marking the end of Wake Island’s commercial aviation history. That same month, in July of 1972, following a study the FAA conducted in 1971 to determine the feasibility of continuing to support operating costs at Wake Island, the FAA turned administrative control of the island over to the USAF (MAC), although legal ownership stayed with the Department of the Interior (Aaron, January 2008). One year later, in July

of 1973, the USAF (MAC) turned that control over to the Pacific Air Forces (PACAF) Detachment 4, 15th Air Base Wing (15th ABW) at Hickam Air Force Base (HAFB) in Hawai'i.

8. 1972-1975 PACAF and Project HAVE MILL

Following a plan (concept of operations) PACAF created in March of 1973, PACAF Detachment 4, 15th ABW assumed control and management of Wake Atoll on July 1, 1973 and began providing support for the U.S. Army's HAVE MILL project on a reimbursable basis (Aaron, January 2008). Project HAVE MILL was an Air Force Systems Command (AFSC) Space and Missile Systems Organization (SAMSO) Athena missile launch program in support of the Army's Advanced Ballistic Missile Defense Agency (ABMDA) detection and discrimination programs. It involved the launching of Athena missiles from Wake Island to Roi-Namur Test Range, Kwajalein Atoll, for research purposes. The launch site at Wake Island was deemed economical because instrumentation needed already existed. And, because of the remoteness of Wake Island, there was far less chance of any loss of life or property damage in case of missile malfunction (Aaron, January 2008).

The plans called for launching to commence in either December, 1973 or January, 1974, and to last for approximately 5 months. The population on Wake Atoll, which consisted of military personnel or civilians working for Genco (launch site construction support), Standard Oil of California (SOCAL) (fuel support), Kentron (communications equipment support), and FMC, was about 500 in July of 1973, peaked at 600 in December 1973, and then returned to 500 at the conclusion of testing in June of 1974.

SOCAL had decided to withdraw from the contract because it was losing money, Pan Am had let its contract lapse, and with the Athena launches completed in June of 1974, by March of the following year the population had once again dwindled. By 1975, with the conclusion of the HAVE MILL program there appeared to be no projects for Wake that would support its operating costs of \$2 million (Aaron, January 2008). With funds short and costs rising, in February of 1975 the USAF approved private aircraft to land and refuel at Wake Air Field (WAF) to help offset operation costs. The small revenue generated helped reduce operation costs, but not by enough. Consideration was then given to assigning alternative uses at Wake for unused and abandoned buildings that were still in good shape or to disassemble and ship them to Hickam AFB in Hawai'i. Before any plans could be worked out, Wake Atoll was faced with a sudden influx of 8,000 refugees from South Vietnam, and all the facilities were utilized (Aaron, January 2008).

9. 1975 South Vietnamese Refugee Operations

Near the end of the Vietnam Conflict, North Vietnamese forces launched an attack against South Vietnam in January of 1975. After 3 months of fighting, South Vietnam surrendered unconditionally on April 30, 1975. Fearing for their lives, many South Vietnamese citizens fled their country. The U.S. government, under President Gerald Ford, agreed to assist in the evacuation of South Vietnamese orphans to the United States. The evacuations took place in two phases—Operations BABYLIFT and NEWLIFE. Operation BABYLIFT focused on flying out orphans, and Operation NEWLIFE focused on evacuating politically sensitive refugees (Aaron, January 2008).

In total, the 15th ABW would process 92,126 refugees through Wake Island. U.S. forces supported the movement of almost 100,000 orphans, refugees, and evacuees from Southeast Asia to the United States from April 4 to September 3, 1975 (Aaron, January 2008).

10. 1975-1994 Emergency Airfield and Military Exercises

After the Southeast Asian rescue efforts of 1975, Wake Atoll resumed its post as a standby for emergency recovery. It also served as a practice area for Navy and Marine TRANSPAC exercises, serviced civil aircraft with fuel, and served as a patient transfer point for injured seamen. The base also supported the National Weather Service (NWS), American Telephone & Telegraph Company (AT&T), National Oceanic Atmospheric Administration (NOAA), the Navy's Military Sealift Command, and a detachment of U.S. Marine Corps personnel.

During the time period covering 1977 to 1981, a U.S. Navy C130 seaplane crashed into the ocean in June of 1977, about 1 mile off shore after taking off from Runway 10 at Wake Island. All crew members (16) perished. In September of 1979 the Atoll was visited by a group of Kili-Bikini Islanders, who had considered relocating their populations there in the aftermath following nuclear testing that the U.S. undertook in their area. Another typhoon, Typhoon Freda, hit the atoll in March of 1981, destroying a new \$7 million seawall and leaving only about 2,500 feet of usable runway (Greenbaum 2009).

Also, during this 5 year time period, two groups of Japanese citizens arrived to memorialize their war dead. The first party of 40 arrived in February of 1978 and stayed for approximately 2 weeks, to exhume, cremate, and return to Japan the remains of only 954 of their WWII soldiers. They had been unable to locate the remains of 600 more because the site of their mass grave on Peale Island could not be found. Then in April of 1981, a party of 19 Japanese citizens visited Wake Island to pay their respects at the Japanese Shinto Shrine (Japanese Memorial) for their war dead. The shrine was blessed and dedicated in a ceremony that took place twenty-three years earlier, overseen by the Japan Wake Island Friendship Committee on September 30, 1957 and completed on February 1, 1958 (Greenbaum 2009).

The Department of the Interior designated Wake Atoll as a National Historic Landmark (NHL) in October 1985 in recognition of one of the nation's most significant historic resources associated with WWII in the Pacific and transpacific aviation prior to the war (Aaron, February 2008).

In 1987, Wake Island was selected as a missile launch site to support Project Starbird, which was part of President Reagan's Strategic Defense Initiative (SDI). In this test of technology for spotting launches and tracking missiles from space, missiles would be fired from Wake at predetermined times and synchronized with an orbiting space shuttle that would use a sensor device to track the missiles. During the early 1990s, Wake Island participated in military operations, including Desert Shield, FIERY VIGIL, and Desert Storm, as a fueling station (Aaron, January 2008).

11. 1994-2001 U.S. Army Administration

On October 1, 1994, the U.S. Army assumed administrative command from the USAF of Wake Island, although title remained with the Department of the Interior. Wake Island became part of the U.S. Army's Kwajalein Atoll (USAKA) command, home to the Reagan Test Site. Wake Island became a functional adjunct to the Reagan Test Site, and was administered by Detachment 1 of the 15 AW Group of the USASMDC (United States Army Space and Missile Defense Command) in Huntsville, Alabama. The U.S. Army operated the island under a caretaker permit from the USAF, and it became known as the Wake Island Launch Center (Aaron, January 2008).

The Army's purpose on the island was to begin testing the Theater Missile Defense system in support of the Ballistic Missile Defense Organization's target and defensive missile systems. These included tactical and theater missiles that were designed to protect U.S. friends and allies from the threat of missile attack. In support of the mission, target missiles were launched from Wake Island and intercepted by defensive missiles launched from USAKA (Aaron, January 2008).

Other uses for Wake Island included the launching of two scud-like missiles in February 1996 for interception by missiles on USAKA or a nearby missile launch ship; an alternative landing location for NASA's shuttle program orbiter craft (space shuttle); the staging point for various maritime rescue efforts; and the holding area for illegal Chinese immigrants intercepted by the U.S. Coast Guard (USCG) and returned to China. In 1999, the Army's mission expanded again to include a new facet of missile defense—the use of liquid propellant target missile launches. These missiles were used for targets as anti-missile interceptors, and using this form of missile defense required the construction of new facilities on the island to support this mission (Aaron, January 2008).

12. 2002 Present U.S. Air Force

In 2001, the Chief of Staff of the Air Force issued a directive for air staff to pursue funding to rebuild facilities and infrastructure solely to support contingency operations, and the WIA was placed on Very Limited Operations (VLO) status once the USAF resumed responsibility for atoll operations on October 1, 2002. The runway remains closed except for contingency operations, emergency diverts, and flights in direct support to activities on the island (such as management contractors, missile operations) (Aaron, January 2008).

On August 31, 2006, Super Typhoon Ioke made a direct hit on Wake Atoll, causing destruction of facilities, infrastructure, and WIA in excess of \$80 million (Aaron, January 2008).

The installation currently functions in support of contingency deployments, serves as an emergency landing facility, provides fuel storage, and supports the needs of the Department of Defense (DOD). The USASMDC currently uses Wake Atoll to support missile launching testing operations (Aaron, January 2008).

PART II: PHYSICAL INFORMATION

A. Landscape Character and Description Summary

Wake Atoll consists of three islands surrounding a shallow, central lagoon, owned and managed by the U.S. Air Force. In 1985, the Wake Island National Historic Landmark was established in recognition of the atoll's national significance for its association with WWII in the Pacific, with a period of significance of 1941-1945. The Wake cultural landscape documented in this HALS includes all land areas of the atoll and the features thereupon, as well as the lagoon and the surrounding ocean waters to the outer edge of the coral reef. The document focuses on the cultural landscape associated with the HALS period of significance, 1935-1945, which spans the initial Pan American Airways development through the end of WWII.

Wake Atoll is predominantly a historic military landscape and WWII battleground, with continuing use as an active military installation. The atoll retains considerable natural characteristics as well. It is a vernacular cultural landscape in that it has "evolved through use by people whose activities or occupancy shaped it." The landscape reflects the physical, biological and cultural character of everyday lives and activities of its occupants over time (Birnbaum 1996: 5).

While features of the chronological periods of development are extant across the atoll, the historic periods, per se, are not visually discernable within the current overall character of the site. The historical character and features are intermixed with existing conditions and non-historic features within the current operating military landscape that serves a completely different mission. The primary unifying elements of the cultural landscape of Wake Atoll are the natural characteristics, which are visually and spatially prominent: the lagoon, island shorelines, surrounding ocean and barrier reef, and relatively flat topography. The open expanse associated with the airport and the spine roads on each island also help integrate the historic character with the existing conditions of the landscape.

Today, the majority of the operations and facilities found on Wake Island are associated with the military. Modern (post 1960s) housing and community facilities are located toward the north portion of the island. The central portion contains support facilities (e.g., water catchment basins, water purification and storage tanks, power plant). The airfield and missile launch facilities are situated on the southern portion of the island. Peale Island currently contains no military support facilities. This island has reverted to dense vegetation and is essentially only used for recreation. The western third of Wilkes Island is set aside as a large seabird colony. A petroleum storage area and an inactive asbestos disposal area are located on the east portion of the island. Central Wilkes is covered in dense vegetation and has no active uses.

Despite considerable changes to the landscape – both during the period of significance as a result of war activities, as well as after WWII as a result of demolition and redevelopment – and despite the current condition and use of the atoll, essential features of the historic period remain. These include the prominent boundary formed by the islands' shorelines, the natural features (lagoon, channels, ocean, barrier reef, island topography, and vegetation types), and a diverse mix of man-made features from the key historic development periods (PAA, U.S. military, and Japanese occupation). Collectively, as a result of the atoll's organization, layout, circulation, vegetation, views and vistas, buildings and structures, it remains a significant example of a WWII battleground in existence in the Pacific.

The initial period of development in the 1930s was directly associated with the rise of commercial aviation, as Pan American Airways developed Wake Island as a refueling base. However, this activity was also important in helping to facilitate U.S. military development and expansion plans, specifically in

the Western Pacific. While manmade features from the Pan Am period are limited to the Clipper landing dock supporting structure and foundations on Peale Island, the natural lagoon was a significant functional element of the PAA operations.

The limited extant features from the U.S. military build-up in 1940-41 are located on all three islands. A grouping of igloo magazines remains in central Wake Island, near the site of the original U.S. airfield. These historic structures are perhaps the most impacted by proximity to non-historic structures, namely the terminal building and chapel. While the physical features of the current airfield are not historic, its general location and open spatial character retain integrity. Ruins from the U.S. Naval Air Station structures are located in northern Peale Island and the never-completed submarine basin nearly bisects Wilkes Island. The alignment of the islands' spine roads was established during this period.

The majority of extant historic features in the Wake landscape are from the Japanese occupation, 1941-1945. Representative defensive features include earthworks and fortifications such as excavated trenches, rifle pits, depressions, and coral mounds, as well as reinforced concrete structures such as bunkers, blockhouses and pillboxes. The landscape includes some extant non-defensive, support features too, including concrete building foundations, water cisterns, brick ovens and water and power plants. Features associated with the Japanese runway are concrete apron pavement and large multi-bay aircraft revetments. Due to their defensive function, many of the features are located along the ocean coasts, where post-war development has been relatively limited. The extant airfield features retain physical and visual proximity to the existing runway on the south arm of Wake Island. Remnants of Japanese industrial and support compounds and features are spread out, primarily on Wake, with some on Peale.

B. Character-defining Features

Buildings and structures and other features, including Japanese trenches and fortifications, in existence at the end of WWII were documented by Army map makers in 1945 (U.S. Army Map Service 1945) (see Figure 5). The National Park Service undertook the evaluation of Pacific Island WWII battlefields for NHL status in the early 1980s. Systematic cultural resources investigations of Wake Atoll were first undertaken as part of its evaluation as a potential NHL.

The most comprehensive cultural resources survey of NHL features on Wake was conducted in 1999-2000 by Foothill Engineering to gather data for the Cultural Resources Management Plan (CRMP) (Foothills 2000). It considered the NHL as a single site, and identified features and feature clusters. It introduced the site numbering system that continues to be used. A total of 239 features were recorded: 109 features on Peale Island, 105 on Wake Island, and 25 on Wilkes Island. Subsequently, *Wake Island NHL Hurricane Damage Assessment* (Aaron, February 2008) was undertaken. Of the features surveyed in 1999, 31 (28 percent) on Peale Island, 12 (11 percent) on Wake Island, and 7 (28 percent) on Wilkes Island were not relocated in 2007. These features are assumed lost due to Typhoon Ioke, other erosion agents, or dense vegetation.

The 2008 *Wake Integrated Cultural Resources Management Plan* (ICRMP) compiled features from the surveys and inventories completed to date (119 feature clusters comprising over 300 recorded features), and applied the CRMP alpha-numeric system to all reported sites (Verhaaren 2008: 2-9 and 3-11). The numbering convention designated each feature cluster by a two-letter code tied to the island on which it is found: PI for Peale, WL for Wilkes, and WK for Wake.

The Wake Atoll cultural landscape, documented in this Historic American Landscapes Survey (HALS), is composed of character-defining features that individually or collectively contribute to the landscape's

physical appearance as it has evolved over time. Key features of the Wake cultural landscape are discussed in the subsections below, organized by 11 landscape characteristics: topography and drainage; vegetation; fauna; natural water features; spatial organization and land patterns; circulation; views; built/designed water features; buildings and structures; small scale elements; and archaeological sites. When applicable, references in this HALS to previously reported features utilize the ICRMP alphanumeric identifier. Figure 3 depicts the NHL feature cluster locations, as documented in the ICRMP.

Physically, there have been incremental, yet significant changes at Wake Atoll in the 65 years since the end of WWII. The degree of change varies considerably by island and by geographic and land use areas of each island. Nevertheless, the general character of the historic period is evident – largely due to the presence of key landscape characteristics that exemplify the landscape’s overall integrity and serve to unify the collective historic character of the cultural landscape of the atoll. These key characteristics are the prominent and ubiquitous natural features (the lagoon, surrounding ocean and reef, vegetation and topography) as well as the atolls spatial organization and land patterns.

While the physical condition of many individual features is deteriorating (particularly the Japanese-built concrete structures) and other features are ruins (e.g. Pan Am pier, NAS building foundations, etc.), and new development has obscured or erased historic character, the integrity of the Wake landscape has largely been retained. Within this broad, unified landscape, the extant feature clusters and individual features – regardless their condition – contribute to the landscape and help tell the incredible story of the atoll from 1935 to 1945.

1. Natural Features

a. Topography and Drainage

Wake Atoll comprises three islands enclosing a shallow lagoon that is open to the ocean on the northwest extremity. The islands are surrounded by a coral reef that extends from a few feet to several hundred feet offshore. The V-shaped atoll consists of approximately 2.73 square miles of total area, with approximately 1,747 acres of dry land mass, 10 miles of Pacific Ocean coastline, and 6 miles of lagoon shoreline.

Due to Wake Atoll’s small area, flat topography, and substrate, ground water resources on the islands are extremely limited. Any fresh rainwater that infiltrates into the permeable substrate tends to drain rapidly into the lagoon or the Pacific Ocean. As a result, ground water is brackish and non-potable (Verhaaren 2008: 2.3).

The maximum elevation on Wake Atoll is 21 feet above mean sea level, and all islands are fairly level with an average elevation of 12 feet above msl (Aaron, February 2008). The seaward face of Wake Island maintains a fairly uniform elevation of approximately 18 feet with a gradual decrease toward the center of the island and then to the lagoon. Beaches are mostly formed of bright white irregular coral heads, with localized areas of sand (Verhaaren 2008: 2.3).

During WWII, the natural, relatively flat terrain of the atoll was substantially altered. The Japanese built a range of facilities and features that modified the islands’ ground surface. Some – such as large anti-tank ditches, linear embankments, and coral mounds – involved only the movement of earth. Most ditches were built roughly parallel to the beaches, especially those beaches that were likely landing sites (east Wake and south Wake and Wilkes). Other ground-altering features included man-made structural elements such as rock walls, building/structures,

or roof coverings. Examples of these were “revetted structures” (i.e., structures surrounded by embankments of coral rubble or constructed within excavated trenches), underground magazines, defensive positions such as concrete blockhouses and pillboxes covered with mounds of coral rubble and sand, mazes of coral cobble-lined trenches and rifle pits, and concealed emplacements. The ground surface was further modified by bomb strikes throughout the war.

While localized rugged terrain from extensive trenching and mounding during WWII is still evident, particularly on Wilkes and Peale Islands, the atoll’s landform today reflects extensive grading for post-war reconstruction and subsequent developments, as well as landform changes from storm waves and inundation. Wake Island has, for the most part, been leveled and filled. Large areas were leveled shortly after WWII for construction of Civil Aeronautics Administration facilities and extension of the runway. The flat, linear expanses on Wake Island associated with the existing airfield are character-defining in terms of topography, because they retain the integrity of the historic airfield’s location, setting, configuration, and feeling, even though the actual physical features are not historic. Although Japanese anti-tank trenches were built along the south and east shorelines of Wake Island, essentially none is evident today. A small coral-lined trench complex and numerous coral mounds associated with extant defensive structures (blockhouses, pillboxes, etc.) remain on Wake, however these features are discussed in Section 6, Buildings and Structures.

Wilkes Island ground surface has undergone considerable disturbance. The spoil from dredging the submarine channel remains along the lagoon shore to the south east and a sand quarry is located just north and east of the channel (Verhaaren 2008: 2-10). The northern tip of the island was leveled for a former VORTAC installation, which is now the heart of the bird refuge. The southeastern quarter of the island is now level to accommodate the jet fuel farm, except for the containment berms built around each tank.

There are two large defensive complexes (WL-02 and WL-03) in central Wilkes, one on either side of the submarine channel, that retain considerable topographic diversity due to coral mounds, depressions, and trenches. Many of the features are personnel trenches and rifle pits that retain coral-lined walls and fall into the “Structures” feature category. Other trenches and depressions have remnant lumber and construction materials at the bottom, but no longer contain intact structures, and are therefore topographic features today. In complex WL-02, in the center of northern Wilkes, there is an anti-tank trench that runs roughly parallel to the lagoon shore for about 650 feet, with a depth ranging from 10-20 feet. Originally, this trench likely extended further southeast, but now terminates near the disturbed quarry area (Aaron, February 2008: 2-66). Wave action and redistribution of coral rubble is also likely to be responsible for the filling of many of the antitank ditches originally created along the shoreline of Wilkes (as well as Peale and Wake), as depicted on the 1945 Army map. The defensive fortifications of feature complex WL-03 (immediately north of the fuel farm) include three large coral mounds measuring 70-90 feet in diameter with heights of 8-15 feet. One mound still has a gun emplacement on top. Most of the topographic features are overgrown with dense vegetation.

During the Japanese occupation, Peale Island was virtually covered with revetted structures. Today, however, most of the structures have been removed or otherwise deteriorated or destroyed, leaving only the depressions in which they once existed (Jackson 1996: 62). Such depressions are character-defining topographic features, reminiscent of their original use. There is a well-preserved anti-tank trench and berm complex (Feature PI-41) in the southeastern section of the island, extending inland from Flipper Point. Near the northern tip of Peale, there is a long

(about 250 feet) anti-tank trench, averaging 23 feet wide and 5 feet deep) parallel to the shorelines on the south side of Peale Avenue (Feature PI-26-1). There are numerous other coral rubble mounds and depressions scattered around the island, usually associated with former Japanese defensive complexes that did or still do contain structures.

b. Vegetation

The disintegrated coral ground surface and calcium carbonate substrate typical to all three islands are desiccating to plants. Fertility is very low due to the lack of essential nutrients and organic matter. Soil formation processes are precluded by high winds, high waves, and localized inundation. As a result, soils are lacking as are the environmental conditions conducive to developing complex and varied plant associations. The natural plant communities of Wake Atoll are composed of fewer than 20 native species (Verhaaren 2008: 2.3).

The *Tanager* Expedition made an extensive biological survey of Wake Atoll in 1923 (www.janeresture.com/wake). It found that much of the surface of all three islands was covered by scrub forest, 12-20 feet high. Some of the forest was so dense that one could not walk through it with speed or comfort. The dominant tree on islands was *Tournefortia argentea* (also known as *Messerschmidia argentea* and beach heliotrope), which grows to a height of about 20 feet, with an umbrella-shaped canopy. *Pisonia grandis* was found on the northwest end of Wake Island. Tall wiry bushes of *Pemphis* were apparently spreading rapidly along the lagoon beach to the east and north on Wilkes Island. Small clumps of scrubby *Cordia subcordata* (kou) were recorded growing in the interior of Wake Island.

Findings of past studies of the vegetation on Wake Atoll, with respect to the effects of typhoons, are in line with the principle that vegetation of a pioneer character, such as that on dry atolls like Wake, recovers its original appearance and composition very rapidly after damage. It also supports the idea that most atoll plant species have evolved means of quick recovery from the effects of typhoons (Fosberg 1969). This information, together with the review of historic records and photographs from the 1920s-40s, supports the premise that the most prevalent native vegetation type, *Tournefortia argentea* scrub forest, is significant in that it represents a species that was historically predominant on all three islands prior to initial development in the mid 1930s. *Tournefortia* is identifiable in numerous ground and low oblique photographs from the Pan Am era, primarily of Peale Island. The high-level aerial and oblique photos available from the 1940s indicate changes in the massing and patterns of vegetation and clearing as military development expanded across the islands, however the specific species are not discernible. Based on its ability to recover quickly from catastrophic events (whether typhoons or war), and the *Tanager* documentation of existence in the 1920s, it is probable that the other currently-prominent native vegetation types were part of the atoll's landscape during the period of significance. These would include *Cordia subcordata*/*Pisonia grandis* forest and *Pemphis* wetland scrub.

The vegetation on Wake Atoll – both native and introduced species – is known to quickly spread, and has obscured abandoned sites and structures on all islands. *Cordia* is particularly fond of Japanese trenches where organic matter accumulates and moisture may be retained (Verhaaren 2008: 2.3). *Casuarina equisetifolia* (ironwood) was commonly planted on the atoll in the 1970s and has since naturalized itself as dense forest areas with little understory growth on all islands, most commonly along shorelines.

Wilkes Island

Distant views of Wilkes Island in 1935-1941 aerial photos show a consistent dense mass of vegetation covering the island, inland of the coral shoreline (Cohen 1983: 2, 4, 8). A 1943 aerial (Cohen 1983: 81) and the 1945 Army map show wide, unvegetated ocean shorelines (cleared for the construction of antitank trenches), and large unvegetated areas on either side of the dredged submarine channel that bisected the island. The remainder of the island was primarily covered in “brushwood.” In 1969, the island was mapped as “umbrella [likely *Tournefortia*] and brush.”

Vegetation patterns on Wilkes today vary considerably from the period of significance; however *Tournefortia* is still the predominant species of the scrub forest areas, with patches of *Cordia*. The scrub forest has reestablished itself throughout the center of the island (on both sides of the submarine channel). Tall, dense stands of the non-native *Casuarina* are common along the ocean shoreline, the lagoon shoreline of the eastern portion of Wilkes, and along the edges of the channels. Introduced grasslands on the western end of the island are mowed to maintain sooty tern nesting habitat and to prevent nesting near the runways (15th Airlift 2009: 3-19). The fuel farm on the east end of the island is surfaced with coral, pavement and mowed grasses. (Refer to Figure 2).

Wake Island

Aerial photos from 1941-1942 (Cohen 1983: 5, 79) indicate that Wake Island had a consistent, relatively dense vegetative cover in most areas except the airfield in the center, the developed Camp 1 and 2 areas at the western tips of each arm, and the well-defined roadways. By 1945, considerably more clearing had occurred to accommodate the Japanese expansion of the runway and airfield, as well as along the ocean shoreline for the extensive trench and embankment network.

Presently, much of Wake Island can be characterized as developed and disturbed ruderal areas of mostly introduced and weedy species that are mowed regularly. The intertidal areas and tidal pools on the lagoon side of Wake Island contain native *Pemphis* scrub, which is dominated by the multi-branched large *Pemphis acidula* shrub with *Sesuvium portulacastrum* (sea purslane), a native succulent groundcover (15th Airlift, April 2009: 3-19). Dense masses of tree vegetation on Wake are generally limited to sparsely developed and developed but abandoned peripheral areas. For example, *Casuarina* has taken over the abandoned 1970s housing area along Wake’s central east shore, and is the predominant species along central southern shore, extending seaward beyond the pillboxes. Central Peacock Point contains a dense mix of *Tournefortia* and *Coccoloba uvifera* (sea grape), surrounded by masses of either *tournefortia* scrub or *Casuarina*. Heel Point is covered with *Tournefortia* scrub, although there are large masses of *Cordia* and *Casuarina* along North Pacific Avenue.

The native sprawling vine, *Ipomoea pes-caprae* (beach morning glory), is common on Wake’s eastern, sandy shorelines, particularly Peacock Point and east of the runway and near the igloo magazines. Due to the extensive disturbance along the ocean shorelines during the Japanese occupation, this native plant was likely not abundant during the war.

Besides *Casuarina*, common introduced plant materials associated with designed plantings around post-war buildings structures include *Cocos nucifera* (coconut palm), *Pandanus tectorium*

(screw pine), *Terminalia catappa* (Indian almond), *Plumeria* spp., *Scaevola taccala* (naupaka), among others.

Peale Island

Pre-WWII photographs of the Pan American Airways compound on Peale Island depict an open canopy of *Tournefortia* trees over a natural-looking coral and sparsely-vegetated ground surface. A mowed lawn was maintained near the hotel (Cohen 1986: 9, 10). PAA also introduced several ornamental and garden plants. An aerial photo from mid-1941 shows that the majority of the island was undeveloped and densely vegetated (Cohen 1986: 5). The land area east of Flipper Point appears to have been a tidal flat and was nearly void of vegetation. Peale Island was heavily developed by the Japanese during the war, and by 1944 there were very few masses of vegetation (Cohen 1986: 83 and 1945 Army map).

The island's vegetation today is similar to that of the mid-1960s. It is almost fully vegetated, primarily by a scrub forest of *Tournefortia* with and without scattered *Cordia*, and some native population *Pisonia* (Fosberg 1969: 2; 15th Airlift Wing, 2009: 3-19). As on Wilkes, *Cordia* is often dense in Japanese trenches, however there are also thickets of *Coccoloba*. The introduced *Casuarina* is prominent along the lagoon and channel shorelines, and relatively young *Cocos nucifera* have been planted and/or naturalized between Flipper Point and the seaplane ramp.

Although not from the period of significance, there is an individual character-defining vegetation feature worthy of mention. In a hole in the center of a former U.S. NAS building foundation on Peale Island (Feature PI-3) grows a large *Pithecellobium dulce* (opiuma) tree. The original function of this hole is unknown, but reportedly the remains of 954 Japanese soldiers were cremated here before being returned to Japan in 1978. This non-native memorial tree was planted in the hole after the cremations (Aaron, February 2008: 2-14; Hitchcock 1996). This tree has flourished, obscuring the cremation spot, and other vegetation has encroached around it.

c. Fauna

Fifteen seabird species nest or attempt to nest on the atoll, and 95 percent of the bird population is on Wilkes Island, west of the submarine channel. One bird species, the now extinct flightless Wake rail (*Rallus wakensis*) was the only native land bird. The Polynesian rat (*Rattus exulans*) was the only mammal and it likely arrived on Wake Atoll with early seafaring Polynesian peoples. Similarly, two species of reptiles, one skink (*Emoia cyanura*) and one gecko (*Lepidodactylus lugubris*) were first observed and recorded during the early *Tanager* Expedition of 1923. Both species are widespread throughout Micronesia and were likely also introduced to Wake Island by early explorers (Verhaaren 2008: 2-5).

Seabirds and other animals were certainly inhabiting the island during the period of significance, as indicated by this quote from a Pan Am brochure, "Overhead, birds of brilliant plumage – bos'un birds, frigates, man o' war birds, the lovely snow-white terns – are fascinating to watch" (www.west.net/~ke6qp/transpac/wake.htm). However, their physical presence and quantity on the islands are likely much different today. The million-plus seabirds in the bird refuge on west Wilkes Island congregate in large masses on the road, on the beaches, in the open grasslands, in the treetops, and in the sky above, and are very much a physical and audible part of today's landscape character. The naturally occurring species – such as the sooty tern; red-footed, brown, and masked boobies; and the large frigate – are protected under the Migratory Bird Treaty Act

(Garcia 1997: 5). Records from 1923 identify trouble with rats and hermit crabs as pests (www.janeresture.com/wake). Today, the large rat population is not as visible a presence as the birds, but is a serious problem, particularly on inhabited Wake Island, and eradication efforts are being pursued by the Air Force.

d. Natural Water Features

Pacific Ocean and Barrier Reef

As noted earlier, Wake Atoll has 10 miles of Pacific Ocean coastline and is surrounded by a coral barrier reef that extends from a few feet to several hundred feet offshore. These natural coastal features as well as the ocean itself are significant to the Wake Atoll cultural landscape. The ocean was part of the WWII battleground, particularly off Wilkes and Wake Islands' southern coasts, from which aircraft and surface ships and landing craft approached and attacked. The locations of U.S. and Japanese coastal sea and air defense structures and landforms (whether extant or not) were in direct response to the open ocean and offshore conditions.

The natural force of the ocean waters, resulting from wave action during high tides as well as severe typhoons, has undermined, filled with beach material and debris, and/or dislocated many of the extant Japanese fortifications and other defenses that were built in the tidal zone (Jackson 1996: 29). The offshore ocean reefs have also been the site of numerous shipwrecks (Verhaaren 2008: 2-11).

Lagoon

The shallow lagoon enclosed by the three islands covers 1.5 square miles and averages 3-12 feet in depth, depending on the tides, with an overall average depth of 10 feet (Aaron 2008: -1). The lagoon is a significant natural feature of the cultural landscape of Wake Atoll. It is also significant for its historic functions associated with the development and use of the atoll during the period of significance (refer to Section 3 Circulation).

The natural characteristics/conditions of the lagoon have been modified by the inhabitants of Wake Atoll. In the 1930s, PAA blasted many coral heads from within the lagoon to prepare a suitable landing area for its flying boats. The U.S. Navy removed more coral heads and began dredging a channel from the Wilkes Channel towards Peale Island intended for a turning basin, and initiated a channel through Wilkes intended as a submarine pen. During Japanese and allied bombing raids, numerous ordnance is said to have landed in the lagoon. The closing of Wilkes Channel and partial blockage of Peale Channel has resulted in changes in water flow in the lagoon and some infilling. Depths of up to 15 feet have been reported historically. It is possible that these sediments obscure artifacts and features of cultural importance (Verhaaren 2008: 2.3, 2-11).

Channels

There are two natural channels and one man-made channel at Wake Atoll. Peale Channel flows between Peale and Wake Islands and is about 300 feet wide at its narrowest point. The channel is shallow, about five feet at its deepest during low tide and is lined with wide, sandy tidal flats. Historically, there were vehicular circulation structures across this channel. The original bridge and causeway are in ruins and the post-war bridge burned in early 2003.

Wilkes Channel, between Wilkes and Wake Islands, was naturally open from the ocean to the lagoon, but is currently blocked by a solid-fill causeway built in 1946. This straight, narrow channel (about 200 feet wide) appears to have been dredged and modified by 1941 as part of the WWII-buildup construction, which included dredging of the boat basin.

Wetlands

Natural wetlands occur in the intertidal and tidal pools and adjacent ponds along the interior shoreline of central Wake Island, and along the south coast of Peale. Some non-historic, manmade containments near the interior shoreline also qualify as wetlands (15th Airlift Wing 2009: 3-21).

2. Spatial Organization and Land Patterns

The primary spatial character-defining features of Wake Atoll are the large open lagoon surrounded on three sides by the narrow and relatively flat land mass of the islands, and the vast open waters of the Pacific Ocean that surround the atoll. These spatial characteristics have essentially remained unchanged over time.

The spatial organization and land use patterns on the land areas of the atoll have been strongly influenced by two significant factors: the physical configuration of the islands (narrow, linear land masses) and the definitive boundaries created by the lagoon and ocean shorelines. Historically, the islands' relatively uniform vegetation cover was not a major consideration in land use and development on the atoll. However, today the vegetation cover is a major natural feature that affects visual connections between, and recognition of, land use and spatial patterns and relationships. (See Section 1.b. Vegetation).

a. Influence of the Islands' Physical Configuration

The atoll's primary circulation pattern, which was essentially established by the early 1940s, is largely a result of the islands' narrow and linear landforms. The pattern consists of a single major spine road traversing the length of each island, with irregular, short and narrow spur or loop roads extending from it as needed to provide access to individual features or development clusters. This spine-and-spur road pattern was particularly prominent by the end of the war. Although it has been modified, expanded and realigned over the years, it is still the prominent circulation pattern on the islands. Today, the historic spine road alignments are named Wilkes Avenue, Peale Avenue and Wake Avenue. While the atoll's current road network reflects a characteristic spine and spur pattern, and the spine roads retain integrity, there is minimal integrity to the actual locations and materials of spur roads, due to the extensive post-war redevelopment. (Refer also to Section 3. Circulation).

Historically, as well as today, the islands' configuration has influenced the overall development pattern. The size, shape, and orientation of Wake Island were key determining factors in the location of the initial airfield in 1941. The airfield was sited in the most central and widest location of the atoll, at the apex of Wake Island's "V" shape. This location has continued to accommodate runway, taxiway and overall airport expansion and realignment over the years; and today, the large open, flat expanse associated with this aviation land use (including undeveloped clear zones) is the most prominent spatial feature on the islands.

As a result of the long and narrow shape of the islands, development was historically spread out in a linear pattern, interconnected by the spine and spur road network. This is still characteristic of the land pattern on Wake Island. However, due to the current lack of mission-related activity on Peale Island, and the substantial changes in land use on Wilkes since 1945, these two islands no longer exemplify the development pattern associated with the HALS period of significance (1935-1945). The extant features on both islands are mostly ruins, and represent a much lower density of development than existed during WWII. Peale and Wilkes have largely reverted back to natural vegetation cover, with the exception of the bird sanctuary grasslands at Wilkes' western end and the fuel farm at its eastern end.

Wake Island now contains nearly all of the military's active land use and facilities. The relatively open and irregular spatial organization and linear development pattern is generally organized by several distinct activity or functional areas. At the northernmost tip of the island, near Peale Channel, is the community support area known as "downtown." This area contains the housing, dining, medical, retail, and recreational land uses along with the power generator and communications facilities. The downtown is in the same general location, and with the same general land uses, as the early "camps" or cantonment areas for the forces during WWII. The area was Camp Two for contractor personnel during the U.S. WWII build up, and contained the Navy headquarters, barracks, hospital, and radio and power facilities during the Japanese occupation.

The area east and south of the downtown, in the vicinity of Heel Point and the northeastern shoreline, is mostly open and undeveloped, as a result of the removal of post-war buildings associated with the island's peak density related to 1950s-70s CAA/FAA development. The 1970s golf course remains open grassland, but dense vegetation has overtaken much of the area. During the war years, this area was vegetated "woodland" and "brushwood" with some scattered buildings (Army Map 1945).

The industrial area is south of Heel Point, on the lagoon side of Wake Avenue, immediately north of the airfield. It includes aviation and airfield maintenance shops, fire and rescue, aircraft fueling support facilities, civil engineering, and supply warehouses, and water collection, treatment, and distribution facilities. This land use is consistent with the former Japanese industrial use of this area for its water distillation and power plants, water, gas and food storage (Army Map 1945), however the existing industrial area encompasses the 1945 bomber dispersal area, which was historically associated with the airfield.

Today's airport facilities are in the same central location on Wake as the WWII-era airfields, however they encompass a much larger land area. The post-war extensions and realignments of the runway on Wake's south arm have eliminated any remnants of the Japanese Army cantonment area that was here during WWII.

The present-day missile testing land use of Peacock Point differs considerably from the Japanese use of the point for shoreline defensive positions, barracks and gasoline storage. However the spatial character of widely-spaced features surrounded by relatively dense vegetation may be similar.

At the southwestern tip of Wake Island, next to Wilkes Channel, is the small harbor area, which includes docking and warehouse facilities. This tip of the island was one of the first areas

developed by the U.S. military – as Camp One for the Marines in 1941. It was also more densely developed during the Japanese occupation. It is connected by a causeway to the fuel storage area on the southeastern end of Wilkes, which was vegetated and contained few structures during WWII.

b. Land Pattern Influence of the Shorelines

The atoll's shorelines were also an important historic influence on development patterns. In the earliest development period, the lagoon shoreline of Peale Island was the focus for Pan Am development, as well as for seaplane facilities associated with the naval air station. The ocean shoreline (particularly on the southern and eastern shores) was historically the strategic location for land uses and development associated with coastal defense (initially U.S. batteries and gun positions, followed by Japanese defensive structures, trenches, etc). The orientation of defensive structures along the shoreline resulted in an extant linear pattern of somewhat regularly-spaced structures with relatively consistent setbacks. However, this pattern is not readily discernible from ground level due to the dense vegetation that has engulfed the shorelines and the features.

In summary, the lack of mission-related land use and the spatial character on Peale and Wilkes Islands today is considerably different than the islands' active use and development during WWII. While Wake Island continues to support active military use, and some of the land use types are similar to historic land uses (such as aviation, cantonment/community support, industrial, harbor, and fuel storage), the physical facilities supporting current uses are not historic. The majority of historic features on the islands (defensive structures, trenches, etc.) are associated with the primary coastal defense land use during the war, which has not been an active land use on the atoll since the end of the war in 1945. What has remained is the spine road circulation pattern and the linear layout of development clusters along it. The open and expansive spatial character related to the lagoon, ocean, and airfield retain integrity as prominent spatial elements of the atoll's cultural landscape. On the islands themselves, changes in the location, density and type of vegetation since the end of the war has greatly influenced the overall spatial character.

3. Circulation

Numerous "systems of movement" are represented by a variety of circulation features at Wake Atoll. Vehicular, waterborne, railway, and aviation circulation systems comprise significant character-defining features of the atoll, in addition to serving as primary organizing elements. Character-defining features associated with the atoll's historic and current circulation systems are described below, organized by mode. As is true with other types of features, many of the circulation features described here are not mutually exclusive to this circulation category. (For example, a pier, ramp, or runway could also be considered a "structure"; and a boat basin may be considered a "water feature"). However, they have been intentionally described together here due to their commonality as circulation features.

a. Water Circulation and Associated Rail

Until the introduction of air travel (namely via seaplanes in the mid 1930s), transportation to the atoll, and largely between the islands, was waterborne. The earliest Micronesian visitors, seafaring explorers, Japanese bird poachers, scientific expeditions, construction supply ships, and eventually warships, all arrived via the Pacific Ocean. Due to offshore reef conditions, most

ships anchored off the southwestern coast of Wilkes and Wake Islands, in the vicinity of Wilkes Channel. This location is still the primary anchorage for large fuel and supply ships to the atoll.

During the initial construction of the Pan American Airways facilities in 1935, the inability of ships to access the lagoon meant the building of a freight dock on the ocean side of Wilkes and the building of a short railroad through the wilderness of the island. A PAA brochure describes the “famous Wilkes Island Rail Road” as “two city blocks in length” (www.west.net/~ke6qp/transpac/wake.htm). The buildings and supplies were then barged from the steamer to the freight dock, transshipped across Wilkes on the railroad, unloaded and barged or ferried across the lagoon to Peale Island (Cohen 1983: 6). There are no physical remnants of the freight dock or railroad in the cultural landscape.

By late 1935, the lagoon waters functioned as the “runway” for Pan Am’s trans-Pacific “Clipper” seaplane service and for U.S. Navy seaplanes in the early 1940s. Although the actual use of the lagoon for aviation ended with the Japanese occupation in December 1941, the lagoon remains a significant character-defining feature associated with the historic PAA and Naval Air Station use of the atoll. Other features associated with seaplane activity are discussed under Aviation Circulation, below.

As part of the U.S. military buildup at Wake in 1941, the natural channel between Wilkes and Wake Islands (Wilkes Channel) was dredged and functioned as the entrance channel to the man-made boat basin. The Army’s 1945 map suggests that the Wilkes edge of the channel was the natural reef, however the Wake edge was modified (squared-off) as part of the creation of the boat basin. The entrance channel averaged about 185 feet in width. The Wake edge of the boat basin was hardened as a wharf, while the lagoon edge of the basin was a narrow embankment accommodating a road atop and a marine railway in the center. Civilian contractors also began dredging a channel across the lagoon between the entrance channel/boat basin and Peale Island (Cohen 1984: 4). The Army’s 1945 map depicts the lagoon channel as about 250 feet wide and about 1.5 miles in length.

Today, the primary landscape features associated with water circulation are Wilkes Channel (entrance channel) and the boat basin (also referred to as the harbor). The entrance channel was part of the NHL nomination however the basin was not. Post-war, the entrance channel has been hardened with a variety of revetment treatments and it no longer opens to the lagoon due to the 1946 causeway construction. The boat harbor has been more substantially modified since WWII, due to the causeway construction and changes to basin edges. However, both the entrance channel and boat basin retain their historic location, configuration, size, and function, and remain important water circulation features of the Wake cultural landscape. Remnants of an abandoned marine railway exist in the same location as the marine railway shown on the 1945 Army map, however the feature itself may not be from WWII.

The southern portion of the lagoon channel is still discernible from atop the Wilkes causeway, as well as from the air, due to the darker blue water color related to the channel depth (refer to Figure 2).

Aside from supply ships that anchor offshore and operational boats using the entrance channel and harbor, waterborne circulation at the atoll today is recreational – fishing and diving boats, sailboats, and kayaks.

Although initially excavated in 1941 for a submarine pen, the “submarine channel” in the middle of Wilkes Island was never completed and never functioned as a circulation feature. Today, it is a man-made water feature within the cultural landscape.

b. Aviation Circulation

Seaplanes

Seaplanes were another form of transportation that affected the cultural landscape of the atoll. In the early 1930s, PAA blasted over one hundred coral heads from within the lagoon to prepare a suitable landing area for its flying boats, the “Clippers” (Verhaaren 2008: 2-11). Pan Am passengers debarked from the “Clippers” at the lagoon-end of a long docking pier with wood planks and supported with reinforced concrete piers, and passed through a hip-roof pavilion on the shore side of the pier on their way to the Pan Am hotel (Cohen 1986: 11). Today, the remains of the pier (Feature PI-15) consist of a pair of parallel concrete beams and cross members and supporting posts that extend about 150 feet inland from the shoreline. A date of 1936 is etched into the concrete near the shoreline. Another section remains standing in the lagoon, about 100 feet from shore (Aaron, February 2008).

As part of the WWII build-up, by mid-1941, construction of the Naval Air Station seaplane base included a seaplane ramp and parking area on the lagoon side of central Peale Island (Feature PI-20). Both circulation elements remain prominent in the cultural landscape today. The narrow concrete ramp (about 70 feet wide on land and 50 feet wide in the lagoon) extends up from the lagoon into the parking area, a distance of about 300 feet from the shoreline (Aaron, February 2008: 2-29). The large, L-shaped seaplane parking apron encompasses about 3.3 acres of square concrete sections. Rows of metal tie-down rings remain imbedded in the concrete, spaced about 20 feet apart creating a grid pattern. The parking area shows evidence of repaired bomb damage. The edges of these features are relatively well marked, but the apron is slowly giving way to scrub vegetation on the perimeter and grasses have become established between the sections of the concrete pavement.

Land Planes

Concurrent with construction of the seaplane base, the American contractors were building the land plane runway on the eastern side of the south arm of Wake Island. By the time of the attack, the east/west runway, measuring 5,000 feet by 200 feet, was completed (as reported in *New York Times* of 25 December 1942, according to Jackson 1996: 8). Subsequently, the Japanese constructed an airfield with three runways, and associated parking and servicing areas (Jackson 1996: 9). Runway A was approximately in the same location and same alignment as the original runway, but, by 1945, was longer, over 6,000 feet in length and about 550 feet wide (Army Map, 1945). Numerous aircraft revetments and the control tower were along the south side of Runway A. Runway B (nearly 5,000 feet long) and Runway C (about 3,000 feet long) intersected with A in the southeast corner of the island. There was a linear “Bomber Dispersal Area” north of Runway B, where the industrial area is today. After the war, in 1949, CAA (forerunner to FAA) built a 7,000-foot paved runway in the vicinity of the previous Runway A, but closer to the lagoon shoreline and at slightly different angle. This runway was extended to 9,800 feet in length in 1959 (www.goldtel.net). On CAA maps dated 1950, the total width was comparable to that of the 1945 runway, measuring 510 feet (150-foot-wide runway with 180-foot “landing areas” on

each side). The CAA Taxiways B and A were in the approximate locations of the 1945 Runways B and C, respectively.

Visually and spatially, the most dominant circulation features at Wake Atoll today are associated with aviation. The existing 10,000-foot-long runway lies east/west along the southern arm of Wake Island, on a slightly offset alignment from the original 1941 runway and the Japanese-built runway. It was not part of the NHL nomination. Taxiway A parallels the runway on the lagoon side and Taxiway B is in the same general location and alignment as the 1945 Runway B and 1950 Taxiway B. The refueling stands are located in the vicinity of the Japanese Runway C.

All that is known to remain of the WWII-era Japanese airfield complex are portions of the concrete surfacing for the original aprons and servicing areas along the south side of the modern runway in the area of the aircraft revetments (Jackson 1996: 24). (The revetment structures are described Section 6). Much of the extant concrete paving is being overtaken by vegetation. While the circulation features of the existing airfield (runway, taxiway, aprons) are not historic, their general location, physical character (open, flat topography, paved expanse), and land use retain the overall integrity of the WWII airfield.

c. Vehicular Circulation

The vehicular circulation system associated with present day Wake Atoll is comprised of a limited network of paved and unpaved roads, many of which are abandoned and/or overgrown with vegetation. The road system also includes one functional causeway between Wake and Wilkes Islands. The ruins of a former causeway and bridges that historically accommodated vehicular circulation between Wake and Peale Islands are non-functional circulation-related features on the atoll.

Roads

The vast majority of the atoll's roads are on Wake Island, where the main vehicular routes also serve as bicycle and/or pedestrian routes. Although there are roads on all three islands, vehicular circulation is limited to Wake Island and eastern end of Wilkes. Since the bridge from Wake Island burned in 2003, there has been no vehicular access to Peale, and vehicles are not allowed west of the submarine channel on Wilkes due to the bird sanctuary. In these areas, the roads are used as pedestrian paths.

The framework of significant historic roads includes those laid out in the 1930s and 1940s to link the activities and land uses established during the period of significance – the Pan Am era and WWII. The organizational pattern as well as road width, grade, edge condition, and surface material, all contribute to the character of the circulation system. Several of the earliest roads on the atoll still exist as primary vehicular or pedestrian routes. Due to lack of post-war development and restricted access, roads on Peale and Wilkes remain largely intact despite abandonment or lack of maintenance and use.

Peale Island

An oblique photograph from May 25, 1941 depicts the irregular pattern of narrow roads in the Pan Am complex (Cohen 1986: 5). A main road, over 20 feet wide, ran parallel to the lagoon shoreline through the complex, between the pier terminus/cabana and the hotel site. South of the hotel, this road curved sharply inland to connect with the main spine road. Narrower roads in the

complex created an irregular pattern, seemingly oriented to provide the most direct route to the support buildings and employee housing. The Pan Am roads appear to have been coral surfaced. There was a pedestrian boardwalk along a portion of the main street (Cohen 1986: 10).

In contrast to the Pan Am roads, the 1941 oblique photo shows the wide, prominent, linear spine road that extended the length of the island, beginning at the bridge across Peale Channel, and the grid-pattern roads northwest of the Pan Am area, apparently built as part of the initial NAS seaplane base. The roads were bordered by dense vegetation. During WWII, the Japanese retained and developed around the original road system, and expanded roads into previously undeveloped areas (Army Map 1945). A narrow road segment connected the causeway in the channel to the spine road. It is uncertain whether the roads on Peale were paved during the war or afterwards.

Today, because of lack of development and use of the island since the 1970s when the Coast Guard station closed, and more recently with the loss of the bridge in 2003, the original (1930s) and WWII road systems have largely been abandoned and overtaken by vegetation. The roads that remain, although somewhat overgrown, provide pedestrian access to the island's features. Peale Avenue retains the exact alignment of the spine road as it was mapped in 1945, which appears the same as the 1941 alignment, and extends from Peale Channel to the northwest tip of the island (Toki Point), roughly paralleling the ocean shoreline. Near the channel, the Peale Avenue corridor is sandy and narrow due to the *Casuarina* overgrowth. The rest of Peale Avenue retains its asphalt surface in varying widths and conditions. In some areas, the average pavement width is about 10 feet and has low weedy vegetation growing through it, particularly at the edges. In other areas, there remain only small patches of asphalt within the invasive vegetation. *Tournefortia* and *Cordia* tree masses are encroaching into the road corridor along most of its length.

Pan Am Road extends from Peale Avenue toward the lagoon and Flipper Point. Inland of the shoreline, it turns northwest and terminates at the seaplane ramp. Formerly the "main street" through the Pan Am area, this is now a narrow, sandy, and heavily overgrown corridor; nearly impassable along the lagoon shoreline. The road between the northwest end of the seaplane ramp and Peale Avenue, originally part of the NAS road grid, is a just two coral tracks in a 15-foot-wide grassy clearing through dense *Tournefortia* vegetation.

Wake Island

Historic photographs of Wake Island in May 1941 depict a very limited road network. A wide corridor cleared of vegetation, with sweeping curves that mimicked the ocean shoreline, extended from Camp Two at the northwestern end of the island, southward and then westward to the Camp One and the fuel storage at the southwest end of the island near Wilkes Channel (Cohen 1986: 5). This corridor likely contained the earliest coral-surfaced, spine road through the island. A much narrower road clearing is visible along the north and east ocean shorelines.

By early 1942, a few additional roads had been constructed to access new Japanese-built facilities (Cohen 1986: 79). However, by the end of the war, the Japanese had created an extensive road network of main roads, secondary roads and trails across all of Wake Island (Army Map 1945). This included the main spine road in the north arm that appears to follow the 1941 alignment. In the south arm, the spine road was realigned to accommodate the airfield. There was a secondary road along the entire lagoon shoreline.

Wake Avenue remains the primary spine road through the northern arm of Wake Island, and was labeled as “Wake Avenue” as early as 1950 (CAA Map 1950). This two lane, asphalt road extends from Peale Channel (where it formerly connected with the bridge) and the “downtown” area in the north to the eastern end of the runway, where it becomes Elrod Drive. Its pavement width averages about 20 feet, but it widens to about 30 feet near the terminal building (Fac. 1502). Typical of all roads on the islands, Wake Avenue is lined with low or mowed scrub vegetation or coral shoulders of varying widths along its length. Wake Avenue handles virtually all through-traffic (vehicular and bicycles) between the downtown and housing areas in the north and the industrial and operations/terminal area to the south.

The present-day alignment of Wake Avenue is essentially the same as the alignment of the WWII-era primary road between the bridge and causeway at Peale Channel and the airfield, and it continues to serve as the primary, central vehicular route through the island’s north arm. The main change to the roadway since the end of the war was the slight shift of the southern, north-south section about 150 feet westward. By 1970, the short segment immediately east of the runway was relocated farther east to the edge of the shoreline.

Although there was a single spine road through the southern arm of Wake Island during WWII, Elrod Drive is the present-day spine road on the southern arm, and reflects a new alignment. It is named in memory of the first WWII Marine airman Medal of Honor recipient, CAPT Henry T. Elrod, for his actions in defense of Wake Island (Cohen 1986: 24). Although the alignment varies from the historic spine road, the location and alignment of the eastern section of Elrod Drive is historically significant. From its intersection with Wake Avenue near the east end of the runway (before it was moved to the shoreline), Elrod Drive is located on the entire southern edge of the 1945 configuration of Japanese runway “A,” a distance of about 6,300 feet. The former runway itself is now overtaken by grass and weeds; however the road’s association with the runway is visually accentuated by the extant aircraft revetments along the southern side of Elrod Drive. Historically, the spine road was located south of the aircraft revetments. From the end of the former runway, Elrod Drive continues northwest, roughly parallel to the ocean shoreline. Like Wake Avenue, Elrod Drive is a narrow two-lane asphalt road with mostly vegetated shoulders.

Aside from Wake Island’s linear spine roads (Wake Avenue and Elrod Drive), the road network has changed considerably since the end of WWII (and the period of significance). Due to the extensive redevelopment of the island as its missions and land uses continued to change (refer to Part I, Section B, Historical Context), the WWII-era roads have essentially been erased from the landscape. New roads were created to serve development clusters, such as the “downtown” area in the north, the industrial area in the center of the island, the former FAA housing area on the east coast, and the missile launch activity on Peacock Point. The roads are typically one- to two-lane asphalt with grass or coral shoulders. Most of the post-war roads remain on the island, however those within abandoned areas (such as the FAA housing area) are rarely used and not maintained, therefore succumbing to overgrowth by natural and introduced vegetation.

Wilkes Island

By the end of WWII, a single road extended from Wilkes Channel through the center of eastern Wilkes Island to the northwestern end of the island, via the narrow land spit remaining from the incomplete submarine channel (Army Map 1945). Trail spurs diverged from the road toward the shorelines. Today, Wilkes Avenue closely follows the alignment of the WWII road, with the exception of a slight realignment north of the fuel tanks. The narrow road has asphalt pavement and flush grassy shoulders between the causeway and the west end of the tank farm. From the

tank farm and across western Wilkes, it remains a coral road, about 10 feet wide, lined with *Tournefortia* and *Kou* trees until it reaches the grassy west end where it is mostly overgrown with grasses. Wilkes Avenue did not extend across Wilkes Channel until the causeway was built in 1946. A two-lane asphalt road with narrow coral shoulders extends atop the causeway to Wake Island.

Vehicular Bridges and Causeways

The initial man-made connection between Peale and Wake Islands was an American-built bridge across the narrowest point of Peale Channel. Based on aerial photos, it was built before May 1941. It may have been built in the mid to late 1930s in support of the Pan Am operations or in early 1941 as part of the islands' road network by the civilian contractors supporting the military (Cohen 1986: 5). It is unknown whether the original bridge survived the 1941 Japanese bombings or later American bombings. At some time, a replacement steel and plank bridge was built in the same location and was functional until it burned in 2003. The bridge was part of the 1985 NHL nomination, and contributes to the cultural landscape, but it was not included in the Wake CRMP and ICRMP as an NHL feature/ruin. Today, two parallel rows of supports in the water and concrete abutments on each shore stand as ruins of the former bridge(s).

During WWII (between early 1942 and mid-1945), the Japanese built a coral-cement causeway (approximately 450 feet long by 12 feet wide) connecting Peale and Wake Island, located about 300 feet north of the bridge. The causeway was bombed by American forces and sunk into the inlet. Today, sections of the causeway are visible at low tide, but it is submerged at high tide. The causeway ruins were also included in the NHL nomination (Feature PI-25). The remaining pieces of the causeway on the Wake side of the channel consist only of the pylons forming the outer edges of the causeway. Nearly the entire surface of the causeway is intact from the middle of the channel to the Peale shoreline, except for the last 30-foot section that is missing. The section in the middle has at least two straight-sided (not arched) flow channels where water can pass through (Aaron, February 2008: 2-32).

The existing solid-fill causeway between Wilkes and Wake Island was built by the Seabees in 1946 (Thompson 1984). It is about 150 feet wide and a quarter-mile long, enclosing the lagoon edge of the boat basin and Wilkes Channel. Wilkes Avenue is atop the causeway. This causeway is non-contributing to the NHL.

4. Views

Currently (as historically) visual connections – achieved through views, key vantage points, and landmark features – are an important aspect of the atoll's character. Visual connections help unify the historic landscape.

Wake Atoll offers some of the most breathtaking views of its natural landscape features. From each island's perimeter of white coral and sand beaches, there are expansive views outward across the shallow reef to breaking surf and the deep blue ocean beyond, and views inward across the aqua lagoon to the islands beyond. These views are much the same today as they likely were when the first person set eyes on the atoll. Prior to the 1940s, scenic views from inland of the shorelines of each island were obstructed by the dense natural vegetation. This is again the case on Peale Island, however this differs from the WWII years when the island was nearly cleared of vegetation for extensive development by the Japanese. Although there are unvegetated inland areas on Wilkes

Island, tree growth along the shoreline obstructs views somewhat from these areas. In contrast, vantage points for open and intermittent views of the ocean and lagoon are relatively common on Wake Island due to the lack of dense vegetation in developed areas, as well as the flat terrain and narrow land-width. The main vantage points are the primary circulation corridors of Wake Avenue and Elrod Drive. Of course, the waters themselves are optimal vantage points for scenic views.

Despite the considerable physical changes to the islands since the end of WWII that have impacted views – both vegetation and manmade changes – there are a number of historic features that remain as prominent visual landmarks within the current cultural landscape, much as they did in the 1930s and 40s. These serve as reference links that play a role in the overall perception of the atoll as a unified historic place. Two of these are the lagoon and surrounding ocean expanse. The breaks in the landmass created by the natural channels between the islands (Wilkes and Peale Channels) are discernable landmarks from coastal vantage points of the lagoon- even from the opposite side of the lagoon from the respective channel. The flat, open expanse of the airfield is visually distinct when viewed from most all of Wake Island and from the lagoon shorelines of Peale and Wilkes. Although the physical runway and other features of the airfield are not historic, their spatial character as a visual landmark on the atoll retains integrity. The large, coral aircraft revetments along Elrod Drive are visually prominent as structures, but their visual connection to the open airfield expanse also contributes to their importance as landmarks.

The location and orientation of some historic features were determined by the desired view from the feature. For example, the Pan Am hotel (not extant) was sited to take advantage of views across the lagoon. Military coastal defensive structures (pillboxes, blockhouses, bunkers, rifle pits, and rock-lined trenches, etc.) were strategically sited, designed, and oriented to provide views outward to the ocean, which remains apparent today.

5. Built/Designed Water Features

Wilkes Channel, between Wilkes and Wake Islands, was naturally open from the ocean to the lagoon, but is currently blocked by a solid-fill causeway. This straight, narrow channel (about 200 feet wide) appears to have been dredged and modified by 1941 as part of the WWII-buildup construction, which included dredging of the boat basin. Today the channel and boat basin edges are hardened with wharves and steel and/or concrete revetments. The channel was part of the NHL Nomination; however the boat basin and causeway were not.

The “Submarine Channel” is an incomplete entrance channel, about 300 feet wide, which opens to the lagoon and almost bisects Wilkes Island. It was being excavated by American contractors for a proposed submarine base at the time of the Japanese attack. The western (ocean) end is a rocky tidal flat with minimal water depth during low tide, allowing vehicular crossing.

6. Buildings and Structures

The atoll was heavily bombed by both the Japanese and Americans throughout the war. During the initial Japanese attack on December 8th, the American’s Camp One was burned out and many structures in Camp Two were damaged or destroyed. The Pan Am facilities were completely destroyed (Jackson 1996). Many American facilities were rebuilt and used by the Japanese until destroyed by American raids. The Japanese also built hundreds of new facilities, many of which were constructed wholly or partially underground. Based on the Army Map Service’s 1945 record of the atoll at the end of the war, all three islands contained many more buildings and structures than remain

today; over 237 on Peale Island, over 92 on Wilkes, and over 600 on Wake (Jackson 1996: 15). Most of these were demolished during extensive post-war reconstruction and subsequent developments. As a result, the majority of the extant NHL buildings and structures at Wake Atoll were built during the Japanese occupation, late 1941-1945.

The NHL buildings and structures on Wake Atoll are documented in detail various reports, most notably the *Historic Preservation Plan for Wake Island* (Jackson 1996), the *Cultural Resources Management Plan for Wake Island* (FEC 2000), and the *Wake Island NHL Hurricane Damage Assessment – Wake Atoll* (Aaron, February 2008). The *Wake Island Integrated Cultural Resources Management Plan* (ICRMP) (Verhaaren 2008) compiles all Wake Island NHL features from the surveys and inventories completed to date (Verhaaren 2008: 2-9), and is the primary source for the numbering system and descriptions of buildings and structures used in this HALS Overview. Refer to these documents for detailed information about individual buildings and structures. Feature cluster locations are depicted on Figure 3.

The historic buildings and structures on Wake Atoll are distributed on all three islands and represent the remains of American and Japanese military presence and limited remains from the original Pan American Airways complex on Peale Island. Many of these features are ruins or are deteriorating rapidly due to weathering and other environmental effects. The NHL buildings and structures are categorized and described below according to primary development periods and the feature's type of construction or function.

a. American Civilian Aviation Structures

Between 1935 and the Japanese attack in December 1941, the Pan Am seaplane station on Peale Island consisted of a landing docking and shelter, a single-story hotel, crew and personnel quarters, recreation building, sick bay, shop and warehouse buildings, utility structures and communication facilities (University of Miami Collection, "Sketch of Wake Island," July 23, 1940). All that remains is the concrete supporting structure and foundations for the Clippers' landing dock (Feature cluster PI-15), which is discussed as a circulation feature in Section 3.

b. American WWII Military Structures

U.S. Naval Air Station Ruins

There are numerous remains of the U.S. Naval Air Station (NAS) that was under construction on Peale Island at the time of the Japanese attack in 1941. The largest feature is a ramp and seaplane parking area (PI-20) intended to serve the seaplanes that were to be based at the station. These are discussed as seaplane circulation features in Section 3.

The concrete foundations, floors and lower walls of several NAS structures (PI-03, -21, -36) show signs of damage from shelling and bombing during the war, but are generally in better condition than many of the other concrete buildings and structures constructed during the Japanese occupation. There appears to be minimal post-war alteration to these features, but spalling of concrete and oxidation of reinforcing rods is evident and portions of the foundations have collapsed (Jackson 1996: 21 and Verhaaren 2008).

Igloo Magazines

The few American military structures that survived the Japanese bombing and subsequent American air raids are earth-covered, reinforced-concrete igloo magazines (WK-01, WK-02 and WK-03), which are evenly spaced in a north-south line east of the airfield, and possibly igloo WK-04). These igloos are of a standard arched vault design dating to 1928 and made mandatory in 1941 (Verhaaren 2008:3-13). They have revetted concrete blast walls parallel to the door elevations. Most of these played significant roles in the defense of the atoll serving as command posts, a communication center, and a hospital during the final days of the Japanese siege. WK-01, -02, and -03 are in fair condition, with spalling and failing concrete on the interiors, and vegetation growing on the coral rubble exteriors. WK-04, which has no remaining blast wall, is in good condition.

c. Japanese Military Structures

By far, the most numerous World War II features associated with the Wake Island NHL are features related to the Japanese occupation and fortification. While all the features constructed by or for the Japanese between 1941 and 1945 are military in nature, they can be divided into defensive features and non-defensive features. Defensive features include gun positions, fortifications, and ammunition storage features, while non-defensive structures include support features, such as housing, administrative and water and power facilities (Verhaaren 2008: 3-20).

Defensive Features

The Japanese defensive features remaining on the atoll include both earthworks/fortifications (i.e., excavated or mounded features) and reinforced concrete (ferro-concrete) structures. Other defensive features include gun mounts and gun emplacements. Support features are also found within the defensive complexes (or feature clusters), such as Japanese brick stoves and water cisterns (Jackson 1996: 58).

Earthworks/Fortifications

Earthworks/fortifications that contain “structural elements” such as coral cobble walls or display evidence of interior structures, and small features constructed of dry-laid coral cobbles and/or wood and tin are included here as “structures.” Earthworks features that do not contain structural elements are discussed in Section 1.a. Topography and Drainage.

Excavated and mounded structures include a variety of feature types, including coral cobble-lined personnel trenches; rifle pits; depressions – some of which display evidence of interior structures, and a variety of walls, pits, and small structures constructed of dry-laid coral cobbles and/or wood and tin; and coral rubble mounds – some of which contain evidence of interior bunkers, berms, and revetments. These structures exist within NHL feature clusters on all three islands. The largest complexes of earthworks/fortification structures are WL-02 and -03 in the central portion of Wilkes Island, both in relatively good condition, although vegetation has encroached; PI-41 on southeastern Peale (condition unknown); and WK-65 (poor condition) and WK-72 (good condition, but encroaching vegetation) on Peacock Point of Wake Island.

Reinforced Concrete Defensive Structures

The most common reinforced concrete defensive structures on the atoll are Japanese pillboxes, blockhouses, and bunkers. For strategic reasons, these were typically built along the shorelines,

and today many are within the tidal zone and are subject to wave action during high tides and severe typhoons. Wave action, enhanced by shoreline retreat, has undermined and dislocated many of these features, and many are at least partially filled with beach coral rubble. Most of these structures would have originally been covered with coral as protection against bombing and shelling. In virtually all cases this covering material is no longer in place, having been removed by natural and artificial means (Jackson 1996: 37). Additionally, the Japanese concrete structures on the atoll, especially the pillboxes, blockhouses, and bunkers along the beaches, are rapidly deteriorating, as the Japanese hastily built them using unwashed beach sand in their concrete. The salt in the sand is causing the internal rebar to rust, resulting in massive spalling of walls and ceilings. Vegetation is encroaching on a number of features, and spalling and crumbling is resulting from root development.

Pillboxes are small low concrete beach defenses that are often associated with block houses and were intended to function with them providing intermeshing lines of fire for beach defense. These structures are scattered all along Wake Atoll's seaward shores and come in two varieties: a single chamber form with a single gun port and a double chambered almost Y-shaped form with two gun ports (Verhaaren 2008: 3-22). On Wake Island, pillboxes are extant on its southern shore and the shorelines of Peacock Point and Heel Point, in feature clusters WK-17, 18, 19, 22, 23, 25, 26, 27, 35, 37, 38, 39, 41, 42, 51, 52, 66, 67, 73, 74, 75, 76, and 77. The sole pillbox on the north shore of central Peale (PI-34) is filled with rubble and included in a modern seawall. There are five pillboxes around Kuku Point at western end of Wilkes: WL-09, 10, 11, 12, and 13.

Blockhouses are heavily reinforced structures to protect observers of live fire. Most on the atoll are 3-chamber, semi-circular blockhouses. Extant blockhouses exist on Wake Island within feature clusters WK-13, 16, 21, 24, 36, 40, 72, 78, and on Peale in clusters PI-04 and 28.

Bunkers are a protected weapon emplacement in an underground fortification system. There are several on Wake Island (WK-13, 29, 31, 32, 34, 48, 49, 54, 55, 56, 59, 62, 65, 70, and 71), three on Peale (PI-08, 10, and 27), and an observation post/bunker on Wilkes (WL-14).

There are remnants of two anti-aircraft fire control centers, partially buried in rubble, with roofs collapsing, and vegetation encroaching. Both are on Wake Island in feature clusters WK-46 and WK-61.

Guns, Gun Mounts and Gun Emplacements

The 8-inch coastal defense gun in feature complex PI-19 is the last of the Japanese defensive artillery pieces to remain in place on the atoll. It is located near Toki Point at the west end of Peale Island and is associated with mounds that may be command or munitions bunkers. Other mounds and trenches are also associated with the gun. Exposed to sea air and not maintained for decades, the gun is rusting. The 2006 typhoon (Ioke) washed much of the protecting coral away from the gun mount, exposing more of it to the air (Verhaaren 2008). Individual gun mount and gun emplacement features are extant within feature clusters on Peacock Point of Wake Island (WK-63, 64, 68, and 72) and PI-34 on Peale and WL-02 Wilkes.

Non-defensive Features

Non-defensive buildings and structures are those believed to have housed and supported the Japanese military occupation on Wake Atoll from 1941 to 1945. Many Japanese structures on the atoll were "revetted," that is they were built surrounded by embankments of coral rubble or

constructed within excavated trenches. Features within the depressions included tin and wood building remains, concrete pads/foundations, water cisterns, and fire-brick ovens. Virtually all of Peale Island was covered with such structures. Today, however, most of the structures have been removed or otherwise deteriorated or destroyed, leaving only the depressions in which they once existed (Jackson 1996: 62). Many previously recorded features were not relocated by the Hurricane Damage Assessment (Aaron, February 2008) following Typhoon Ioke. Feature PI-14 is the only remaining example of a wood and tin structure (countersunk living quarters) built inside a depression on the atoll, however the wood structure has collapsed and the corrugated roof has fallen. Other collapsed and overgrown non-defensive feature clusters are WK-69, 71, and 72 on Wake Island, and PI-32 on Peale.

There are a few extant reinforced concrete non-defensive structures. These structures had military support functions such as storage buildings (WK-29 and WK-34), power and distillation plants (WK-58), and fuel storage structures (WK-60).

Aircraft Revetments

Four extant aircraft revetments on Wake Island are located south of the main runway and Elrod Drive. All of these revetments are believed to have been built by American prisoners of war. Features WK-10 and WK-11 (about 150 feet wide by 45 feet deep) have three bays and are constructed of unshaped coral boulders laid in a herringbone pattern with concrete mortar. WK-12, also three bays and about the same size, is constructed of poured concrete. WK-30 is a U-shaped, one-bay revetment with coral masonry walls in a herringbone pattern. The three 3-bay revetments were reconstructed in 1993 as part of the DoD Legacy Program and are in good condition (Aaron, February 2008: 1-9).

7. Small-scale Elements

The Wake Island NHL contains a variety of small-scale elements associated with atoll's WWII history that collectively aid in understanding its cultural value. These elements tend to be commemorative or aesthetic rather than functional. The commemorative features and external displays provide detail and diversity to the cultural landscape, although not all are historic or contributing to the NHL. A large number of artifacts are stored as internal collections, and are not physically part of the cultural landscape.

a. Inscribed Boulders

Two NHL features, the POW Rock (WL-05) and USS *Nitro* Rock (WL-06), are inscribed coral boulders situated on the shore of the lagoon on the southern end of Wilkes Island. The POW Rock is perhaps the most famous and poignant memorial on the atoll. The inscription "98 US P.W. 5-10-43" was probably created by one of the civilian contractors retained on the island by the Japanese military to build the defense of Wake Island after the American surrender (Jackson 1996:36). The Nitro Rock, which commemorates the visit of the USS Nitro, is inscribed "3-9-35," and may be the oldest historic relic on the atoll (Jackson 1996: 32). The rock is linked with important developments which led to WWII and also represents pioneering efforts at trans-Pacific airline commercial development. Both boulders are subject to wave action and have been increasingly covered by sand.

b. Memorials and Shrine

Wake Island contains four memorials to the various groups of people involved in the history of the atoll. None of these memorials is a historic property, and none is considered contributing to the historic landmark. They are, however, important symbols commemorating the history of Wake Island (Verhaaren 2008: 3-32) and have been assigned NHL feature numbers. The memorials are located across Wake Avenue from the Terminal Building where they are easily accessible to island visitors. They are sited in a linear arrangement, parallel to the shoreline, unified by a coral-gravel pedestrian pathway.

- Marine Memorial (WK-06) honors the Marines who defended Wake Island against the Japanese attack in 1941. The memorial was constructed in 1965.
- Guam Memorial (WK-07) is a memorial to the citizens from Guam who were on Wake Island at the time of the Japanese attack. This memorial was constructed in 1990.
- WK-08 is a granite memorial to the civilian employees of the Morrison Knudsen Company who were constructing the naval base at the time of the attack and helped in the defense of the island. This memorial was constructed in 1988.
- Japanese Memorial (WK-09) honors the Japanese soldiers. It was constructed in 1957, with an engraved stone added in 1966 (Hitchcock 1996). This shrine includes a vault designed as a temporary resting place for any human remains encountered that are determined to be Japanese in origin.

The original Japanese shrine (WK-57) is near the location of the Japanese graveyard (now the golf course). The date this shrine was constructed is unknown. This feature is probably a shrine/monument dating to the Japanese occupation. A “Shinto Shrine” is shown at this location on the Army’s 1945 map (Verhaaren 2008: 3-33).

c. Artifacts and Static Displays

Artifacts

Over the years, a wealth of artifacts dating from World War II has emerged from Wake Atoll’s soil and the sea has continued to wash up spent munitions and other artifacts. These have been collected from various, undocumented locations throughout the atoll. The museum located in the Terminal Building (1502) serves as a repository and displays a collection of artifacts and historical photos and other material, most of which have been donated over time. In 2008, the artifacts were inventoried and entry to the museum was secured.

External Static Displays

Three external static displays of various military artifacts from Wake Atoll have been assigned NHL feature numbers. Other artifacts, such as anchors and propeller blades, are used as decorative elements in the landscape. These displays are typically of large artifacts recovered from various locations on the atoll and often dating to the World War II era. Their origins are largely undefined and their specific role at Wake can not be determined, but they do illustrate the types of weapons and equipment used at Wake (Aaron, February 2008: 2-46).

- The collection across Wake Avenue from the Terminal Building (WK-05) includes pieces of machinery and/or equipment, a possible piece of a searchlight, part of an aircraft engine, a

rusted fragment of a machine gun, a wheel, and other miscellaneous unidentifiable fragments (Aaron, February 2008: 2-46). Part of this collection has been moved in front of the Drifter's Reef in the downtown area.

- The collection on the east side of the Wake Island Airport terminal, facing the runway, includes a U.S. 3-inch anti-aircraft gun, other guns, and aircraft engines (WK-14).
- Feature WK-15 is a static display at the entrance to the downtown area of Wake Island, featuring a U.S. 3-inch anti-aircraft gun recovered from an unidentified location on the atoll. The gun has been set in concrete and cordoned off. Much of the gun's aiming and firing mechanisms are missing.

8. Archaeological Sites

While recent monitoring of construction trenches dug on the atoll has yielded no reported intact archaeological deposits, earlier cultural resources surveys (Hoefler 2000) identified five feature clusters with high historic archaeological potential, all on Peale Island: PI-01, 02, 03, 14 and 30, however PI-30 was not relocated after Typhoon Ioke (Aaron, February 2008). All are Japanese domestic features except PI-03. They are often counter sunk and include wooden beams, tin roofing materials, and domestic artifacts. Because Peale Island saw less reuse by American forces and domestic airline personnel after the war than Wake Island proper, these sites tend to have been less disturbed. The depressions often associated with them allow artifacts and debris to accumulate, along with protective leaves and vegetation. Because the Japanese occupation was short-lived and the water table relatively high relative to the ground surface, it is expected that archaeological deposits would be relatively shallow (Verhaaren 2008: 3-31).

Underwater Cultural Resources

The atoll's reefs have been the site of six known wrecks, three of which relate to WWII. Three Japanese craft beached themselves along the southern shore of Wake, two during the invasion and one on a supply run. Their wreckage has been partly salvaged for scrap metal, but portions of the vessels remain. In addition, the wreckage of WWII aircraft and many unexploded bombs have been reported just beyond the reefs along with more recent aircraft and missile parts (Verhaaren 2008: 2-11).

Nevertheless, none of the cultural resources field investigations so far at Wake Atoll have included underwater investigation of the various shipwrecks that have occurred on and around Wake Atoll, nor does the NHL nomination specifically mention shipwrecks as contributing elements. Likewise, no investigations have been conducted on aircraft, tanks or other artifacts that may be in the lagoon (Verhaaren 2008: 3-3). Any ships, aircraft, or other equipment associated with the Battle for Wake Island, and the subsequent Japanese occupation may be considered contributing elements of the Wake Atoll cultural landscape.

PART III: SOURCES OF INFORMATION

A. Drawings and Plans

From Jackson references page:

Army Map Service. 1945. *Wake Island*, W822, 3rd edition, 1945. Record Group 77, Records of the Office of the Chief of Engineers. National Archives, Washington, D.C. Obtained from Hickam AFB Historic Preservation Officer, March 2010.

CAA (Civil Aeronautics Administration), Ninth Region, Honolulu TH. "*Wake Island Topography*." Map Number: DR-9E-695-1 to -29 of 44. 1950. Obtained from Hickam AFB Historic Preservation Officer, March 2010.

Chugach Support Services, Wake Island Airfield. Wake Island Existing Conditions Map. Obtained October 2010.

B. Photograph and Map Collections

The Pan American World Airways, Inc. Records, Special Collections, University of Miami Libraries, Coral Gables, Florida.

Historical Archives Collection (U.S. Air Force), 15th Wing History Office, Joint Base Pearl Harbor-Hickam, Hawai'i.

C. Bibliography

1. Unpublished Materials

Borger, John. "Log Book of John Borger, Assistant Airport Engineer." 1935. In The Pan American World Airways, Inc. Records, Special Collections, University of Miami Libraries, Coral Gables, Florida.

Breuer, Bill. "Letter to Red, June 24, 1935." In The Pan American World Airways, Inc. Records, Special Collections, University of Miami Libraries, Coral Gables, Florida.

Hitchcock, Lou. "Chronology of Significant Wake Island Dates and Events." Unpublished manuscript by Lou Hitchcock, Air Operations Specialist, Wake Island. Last updated 11 August 1998.

2. Primary Sources, Published

Technical Reports

Aaron, Jayne for 15th Airlift Wing, U.S. Air Force and Chugach Environmental Services. *Historic American Building Survey: Wake Island Airfield, Terminal Building*. HABS No. UM-2-A. 2008.

- Aaron, Jayne for 15th Airlift Wing, 15 Civil Engineer Squadron, Environmental Branch.
Cultural Resources Inventory and Determination of Eligibility of Post-World War II Cultural Resources at Wake Atoll. Hickam Air Force Base, Honolulu, Hawai'i, January 2008.
- Aaron, Jayne for 15th Airlift Wing, 15 Civil Engineering Squadron, Environmental Division.
Wake Island National Historic Landmark, Hurricane Damage Assessment, Wake Atoll. Hickam Air Force Base, Hawai'i, February 2008.
- EDAW, Inc. and Garcia and Associates. *Report for Interpretive Prospectus for Wake Island Airfield.* Prepared for U.S. Army Corps of Engineers, Pacific Ocean Division, Fort Shafter, Hawai'i, 1997.
- FEC (Foothills Engineering Consultants, Inc.), *Cultural Resources Management Plan for Wake Island Airfield.* Prepared for Air Force Center for Environmental Excellence, Brooks Air Force Base, Texas and 15th Civil Engineering Squadron-Environmental Planning Element, Hickam Air Force Base, Hawai'i. 2000.
- Fosberg, F.R. and M.-H. Sachet. *Atoll Research Bulletin No. 123, Wake Island Vegetation and Flora, 1961-1963.* Issued by Smithsonian Institution, Washington, D.C., March 30, 1969.
- Hoefer, Ted, III et. al. *Cultural Resource Investigations at Wake Atoll, 1999-20000, Cultural Resources Management Report No. 55.* Prepared for the Air Force Center for Environmental Excellence, Brooks, AFB, Texas and 15th Civil Engineer Squadron-Environmental Planning Element, Hickam AFB, Hawai'i, by Foothills Engineering Consultants, Inc., 2000.
- Jackson, Thomas L. *Historic Preservation Plan for Wake Island Airfield, Wake Island.* Prepared for U.S. Army Corps of Engineers. Biosystems Analysis, Inc. Kailua, Hawaii, 1996.
- Thompson, Erwin N. "National Register of Historic Places Inventory – Nomination Form for Wake Island." U.S. Department of the Interior, National Park Service, 1984.
- URS Group, Inc. *Final Historical Resources Report of Survey for OT10 and the Hazardous Substances Sites Phase I EE/CA and Stage I Site Inspection for POL Sites, Wake Island Airfield, Wake Atoll.* Prepared for Air Force Center for Environmental Excellence; Contract F41624-97-D-8016, March 22, 2002.
- _____ *Final Cultural Resources Report of Survey for Engineering Evaluation/Cost Analysis Investigations at IRP Sites and AOCS, Wake Island Airfield, Wake Atoll.* Prepared for the United States Air Force 36th Air Base Wing Environmental Restoration Program; Contract F41624-00-D-8028/0012, March 17, 2002.
- United States Strategic Bombing Survey. *The Reduction of Wake.* Prepared by Naval Analysis Division, Marshal-Gilberts-New Britain Party, U.S. Strategic Bombing Survey. U.S. Government Printing Office, Washington, D.C., July 1, 1946.
- Verhaaren, Bruce T. *Integrated Cultural Resources Management Plan, November 2008 - November 2013, for Wake Island Airfield.* Prepared for the 15th Civil Engineer Squadron, Hickam Air Force Base, Hawai'i, Draft Report, October 31, 2008.

15th Airlift Wing , 15 Civil Engineer Squadron, Environmental Division, Hickam Air Force Base, Hawai'i. *Draft Environmental Assessment, Eradication of Rats from Wake Atoll*. April 2009.

Books

Cressman, Robert J. *Magnificent Fight: The Battle For Wake Island*. Annapolis: US Naval Institute Press, 1995.

Cohen, Stan. *Enemy On Island. Issue In Doubt. The Capture of Wake Island, December 1941*. Missoula: Pictorial Histories Publishing Company, 1983.

Kaucher, Dorothy. *Wings Over Wake*. San Francisco: J. Howell, 1947.

Urwin, Gregory J.W. *Facing Fearful Odds: The Siege of Wake Island*. Lincoln: University of Nebraska Press, 2002.

3. Secondary Sources, Published

Technical Papers/Bulletins/Articles

Andrus, Patrick W. *National Register Bulletin 40 – Guidelines for Identifying, Evaluating, and Registering America's Historic Battlefields*. U.S. Department of the Interior, National Park Service. Accessed June 22, 2010.
<http://www.nps.gov/history/nr/publications/bulletins/pdfs/NRB40.pdf>, 1999.

Andrus, Patrick W., and Rebecca H. Shrimpton, eds. *National Register Bulletin – How to Apply the National Register Criteria for Evaluation*. U.S. Department of the Interior, National Park Service. Accessed June 9, 2007.
<http://www.nps.gov/history/nr/publications/bulletins/nrb15/>, 2002.

Birnbaum, Charles A. *The Secretary of the Interior's Standards for Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. U.S. Department of the Interior, National Park Service, 1996.

Bryan, E.H. Jr. *Atoll Research Bulletin*. Bulletin, Washington D.C.: The Pacific Science Board, National Academy of Sciences—National Research Council, 1959.

Little, Barbara, Erika Martin Seibert, Jan Townsend, John H. Sprinkle, Jr., and John Knoerl. *National Register Bulletin – Guidelines for Evaluating and Registering Archaeological Properties*. U.S. Department of the Interior, National Park Service. Accessed June 9, 2007. <http://www.nps.gov/history/nr/publications/bulletins/arch/>, 2000.

Millbrooke, Ann, Patrick W. Andrus, David B. Whipple, and Jody Cook. *National Register Bulletin – Guidelines for Evaluating and Documenting Historic Aviation Properties*. U.S. Department of the Interior, National Park Service. Accessed June 9, 2007.
<http://www.nps.gov/history/nr/publications/bulletins/aviation/>, 1998.

Spennemann, Dirk H.R. "The United States Annexation of Wake Atoll." *The Journal of Pacific History*, (1998): 239-247.

Spennemann, Dirk H.R. "The Wreck of the Libelle." *Micronesian Journal of the Humanities and Social Sciences*, (2005): 108-123.

Books

Cressman, Robert J. *Magnificent Fight: The Battle For Wake Island*. Annapolis: US Naval Institute Press, 1995.

Greenbaum, Don. *Wake Island History*. May 23, 2009. <http://www.goldtel.net/ddxa/history.html> (accessed June 23, 2010).

Sloan, Bill. *Given Up for Dead: America's Heroic Stand at Wake Island*. New York, NY: Bantam Books, 2003.

Internet Sites

"Across the International Date Line to Wake Islands." <http://www.west.net/~ke6jqp/transpac/wake.htm>. Accessed October 15, 2010.

Federal Aviation Administration, last modified February 1, 2010. "A Brief History of the FAA." http://www.faa.gov/about/history/brief_history/. Accessed October 28, 2010.

LeCour, Richard D. "History of Wake Island," *Richard's Ramblings* (blog), September 15, 2002. <http://www.richardsramblings.com/2002/09/history-of-wake-island/>.

"Pan Am Across the Pacific," *Pan Am Clipper Flying Boats*, accessed November 3, 2010, <http://www.clipperflyingboats.com/transpacific-airline-service>.

"Pan American World Airways." <http://www.west.net/~ke6jqp/panam.htm>. Accessed October 15, 2010.

"Photos of Pan American Clippers and Wake Island in 1936 from the collection of William B. Voortmeyer." <http://www.west.net/~ke6jqp/clipper/clipper.htm>. Accessed October 15, 2010.

"Wake Island." <http://www.janeresture.com/wake/>. Accessed October 15, 2010.

"Wake Island History, Chronology of significant Wake Island dates and events." <http://www.goldtel.net/ddxa/history.html>. Accessed October 15, 2010.

"Walsh Family Album, Old Family Photos, PAAville Skyline, Wake Island." <http://www.bark.ch/displayimage.php?album=41&pid=12660>. Accessed October 15, 2010.

PART IV: PROJECT INFORMATION

This Historic American Landscapes Survey (HALS) documentation of the Wake Island NHL was undertaken in accordance with a Management Objective set forth in the Wake Island Airfield ICRMP (Verhaaren 2008: 1-8). The ICRMP identified the HALS as a cost-effective way to meet the USAF's obligations under NHPA Section 110(f) to preserve the story of the Battle of Wake Island for the American people.

Part 1 of the report was researched and written by Joy Davidson, Mason Architects Inc., 119 Merchant Street, Suite 501, Honolulu, Hawai'i 96813 and Part 2 of the report was researched and written by Wendie McAllaster, Helber Hastert & Fee, Planners Inc., 733 Bishop Street, Honolulu, Hawai'i 96813 in August-November 2010, and finalized in May 2011. The large-format photographs were taken in April and May, 2010, by David Franzen of Franzen Photography, Kailua, Hawai'i.

The HALS documentation was prepared under contract with Cultural Surveys Hawai'i Inc., Kailua, Hawai'i, for the Department of the Air Force, Hickam Air Force Base 15th Airlift.

Figure 1: Location Map

(Source of Base Data: USAF, 15th Air Wing, Hickam AFB, Hawai'i)

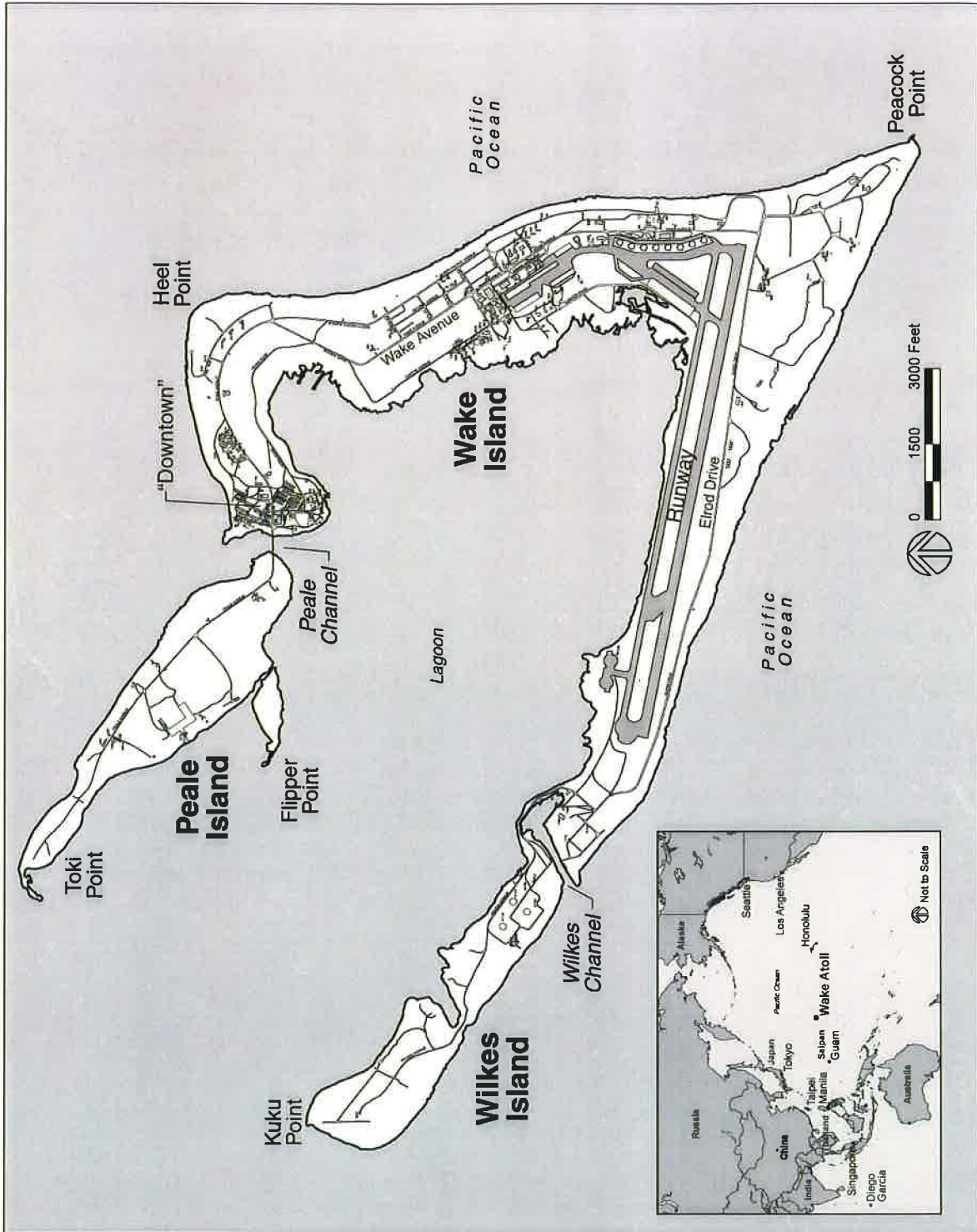


Figure 3: Recorded NHL Feature Clusters on Wake Atoll
(Source: ICRMP November 2008-November 2013. Draft 31 October 2008)

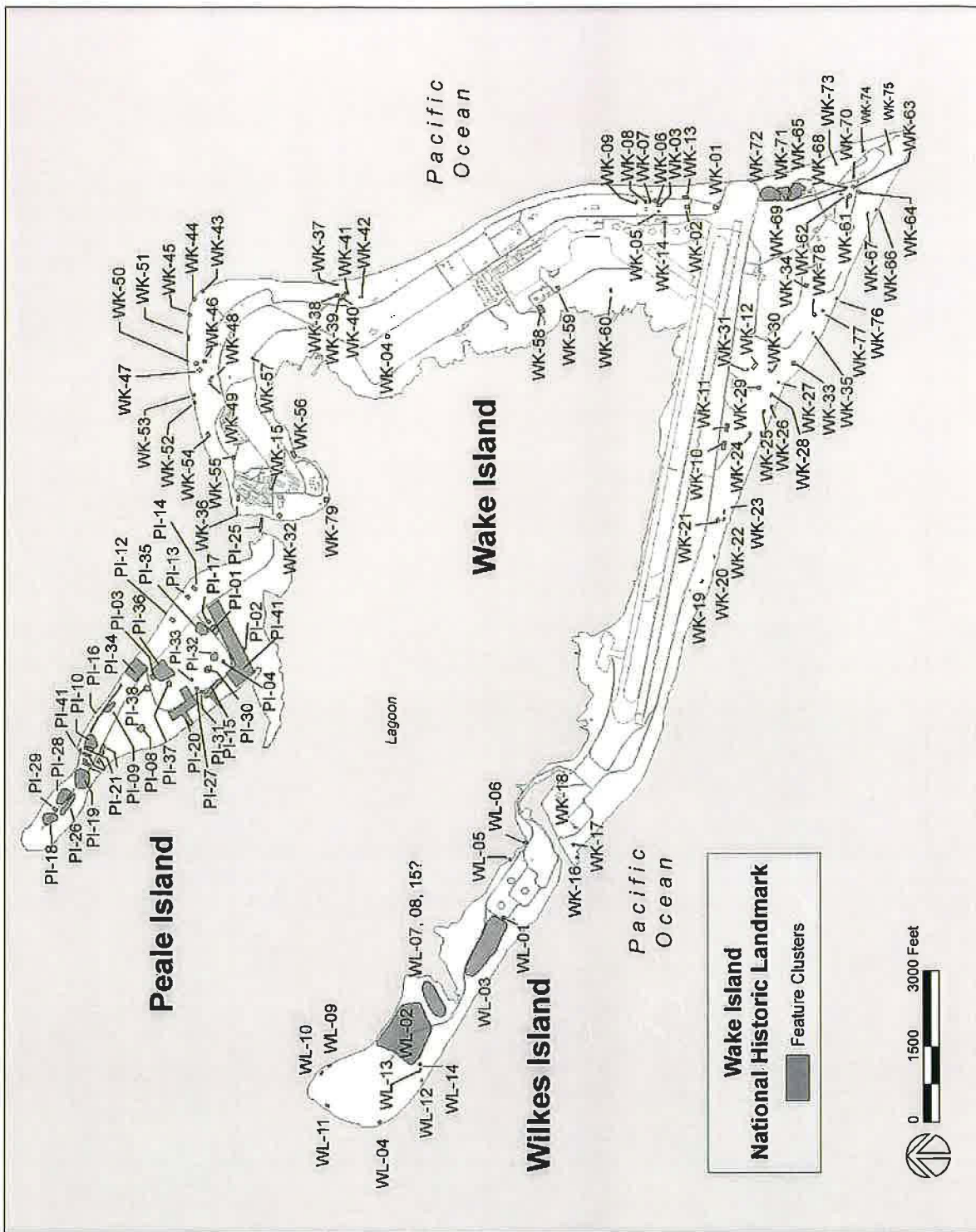


Figure 5: 1945 Map of Wake Atoll

(Source: U.S. Army Map Service, 1945, Wake Island, 1:10:000 map. U.S. Army, Washington D.C. Published in Wake Island Airfield ICRMP, Appendix G. 11 October 2008)

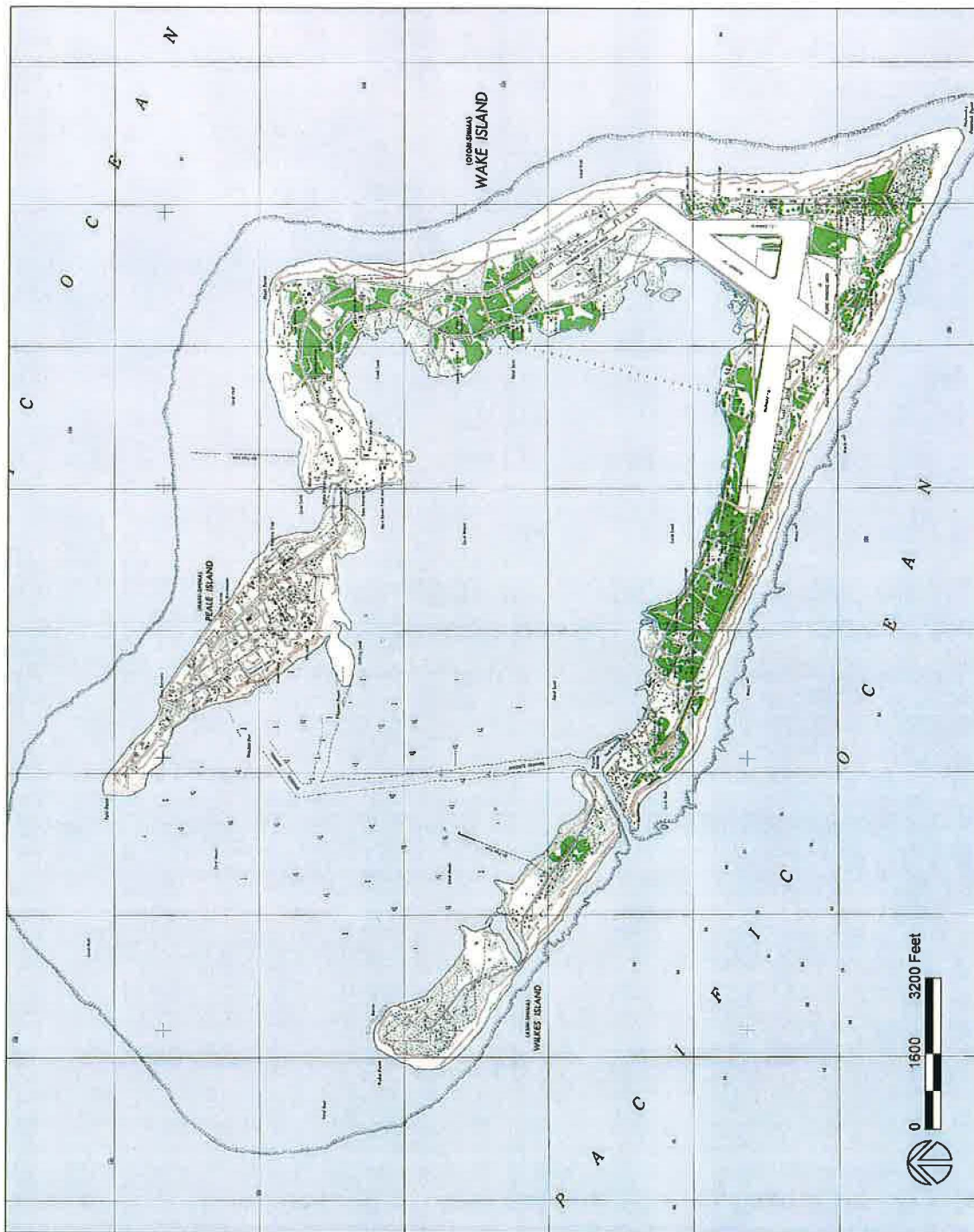


Figure 5a: 1945 Map of Wake Atoll – Peale Island and North Wake Island

(Source: U.S. Army Map Service, 1945, Wake Island, 1:10:000 map. U.S. Army, Washington D.C. Published in Wake Island Airfield ICRMP, Appendix G. 11 October 2008)

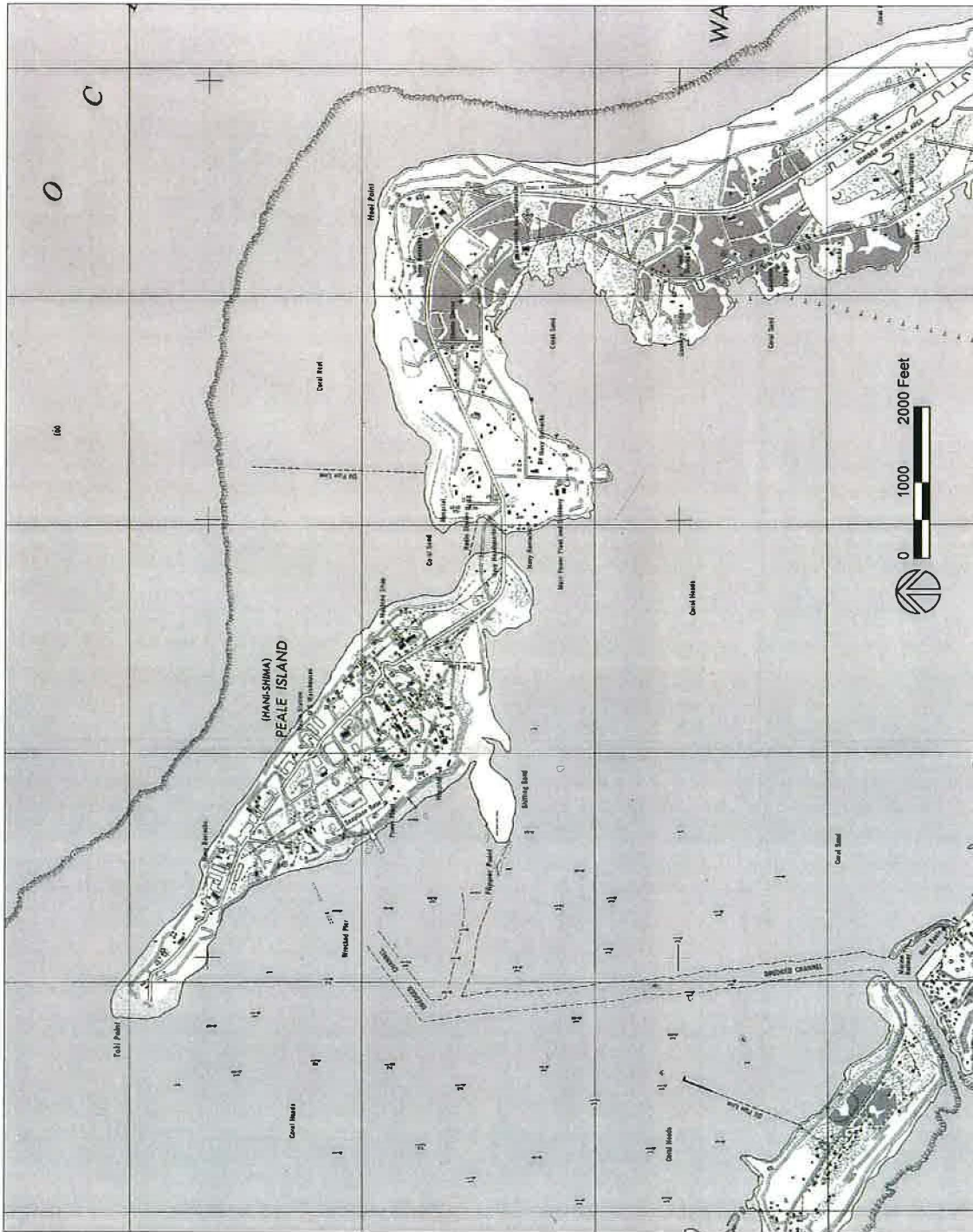
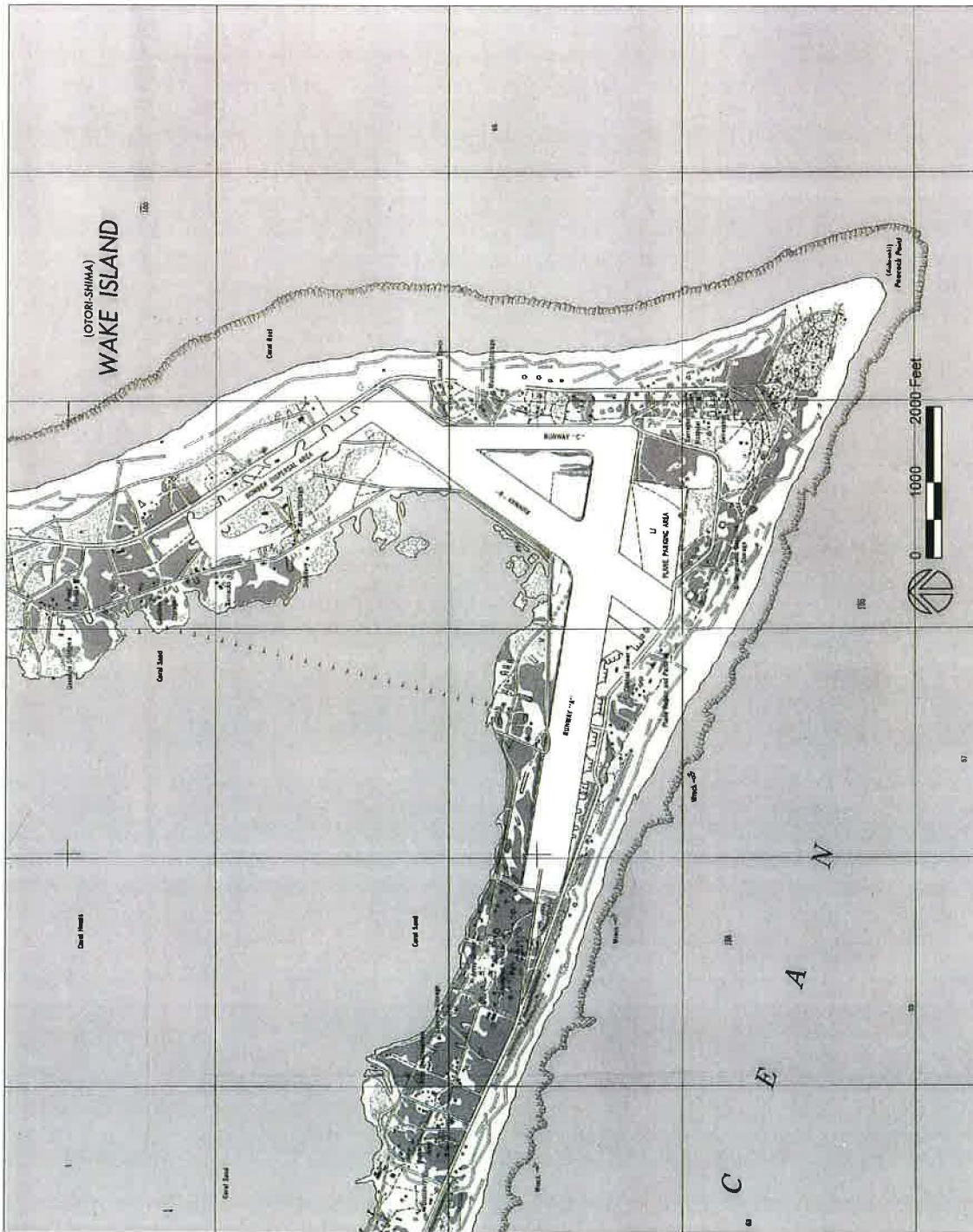


Figure 5b: 1945 Map of Wake Atoll – Central Wake Island

(Source: U.S. Army Map Service, 1945, Wake Island, 1:10:000 map. U.S. Army, Washington D.C. Published in Wake Island Airfield ICRMP, Appendix G. 11 October 2008)



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Figure 5c: 1945 Map of Wake Atoll – Wilkes Island and South Wake Island

(Source: U.S. Army Map Service, 1945, Wake Island, 1:10:000 map. U.S. Army, Washington D.C. Published in Wake Island Airfield ICRMP, Appendix G. 11 October 2008.)

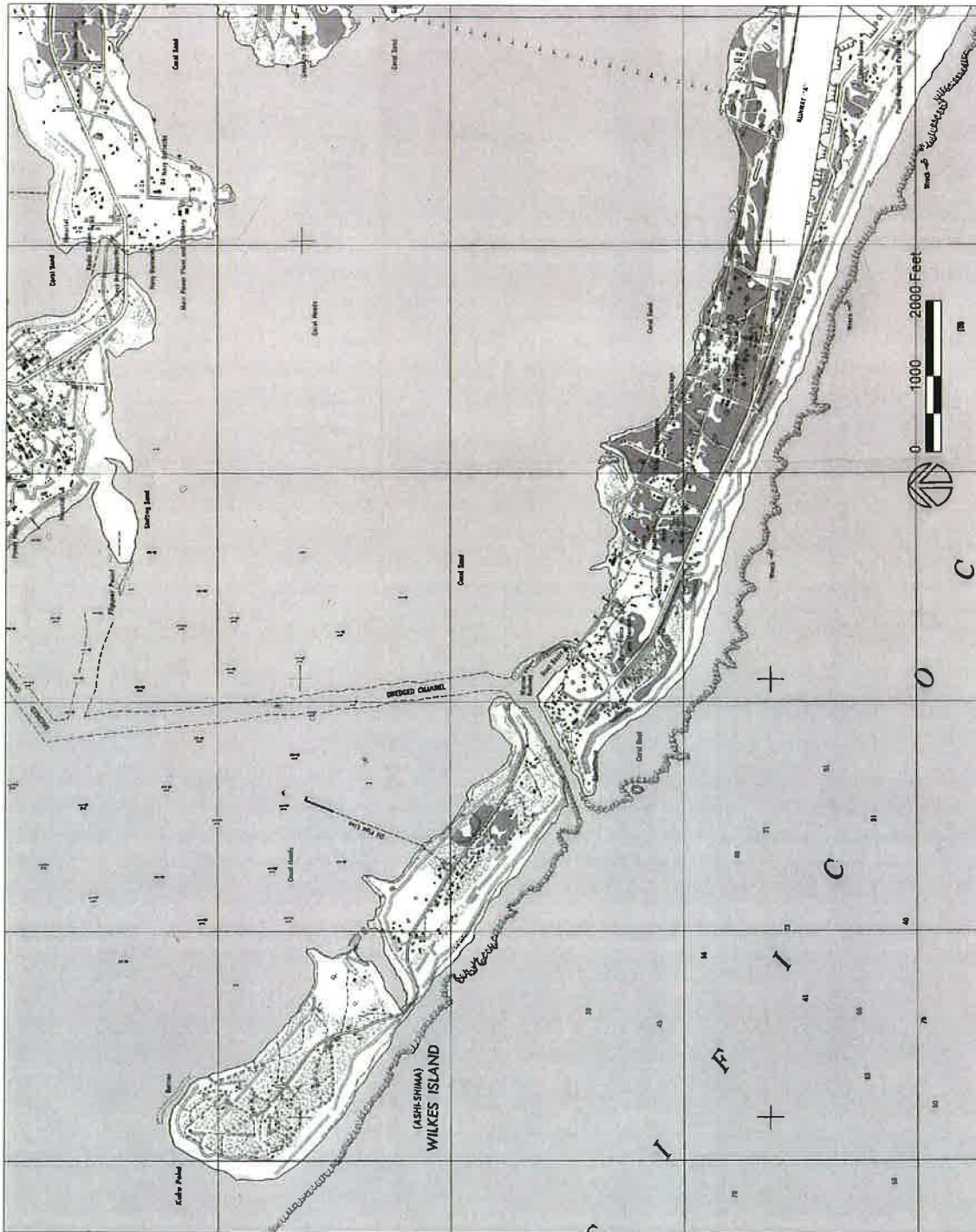
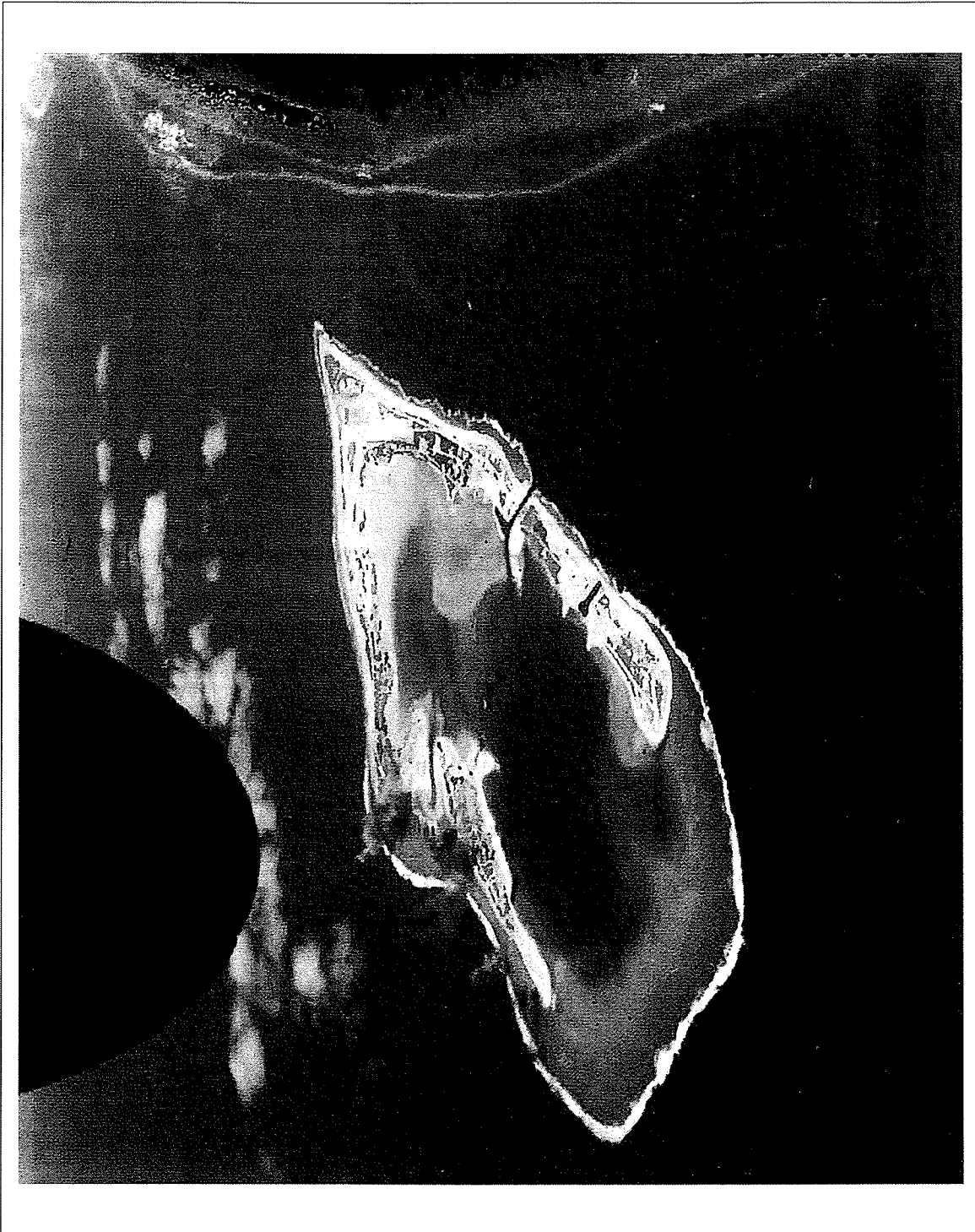


Figure 11: March 11, 1944, Oblique Photograph of Japanese-held Wake.
(Source: Wake Island National Historic Landmark Nomination, 1984. Photo Courtesy of Defense Audiovisual Agency)



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Figure 12: July 1949, Oblique Photograph of Wake Island, looking north.

(Source: Historical Archives Collection (U.S. Air Force), 15th Wing History Office, Joint Base Pearl Harbor-Hickam, Hawai'i)



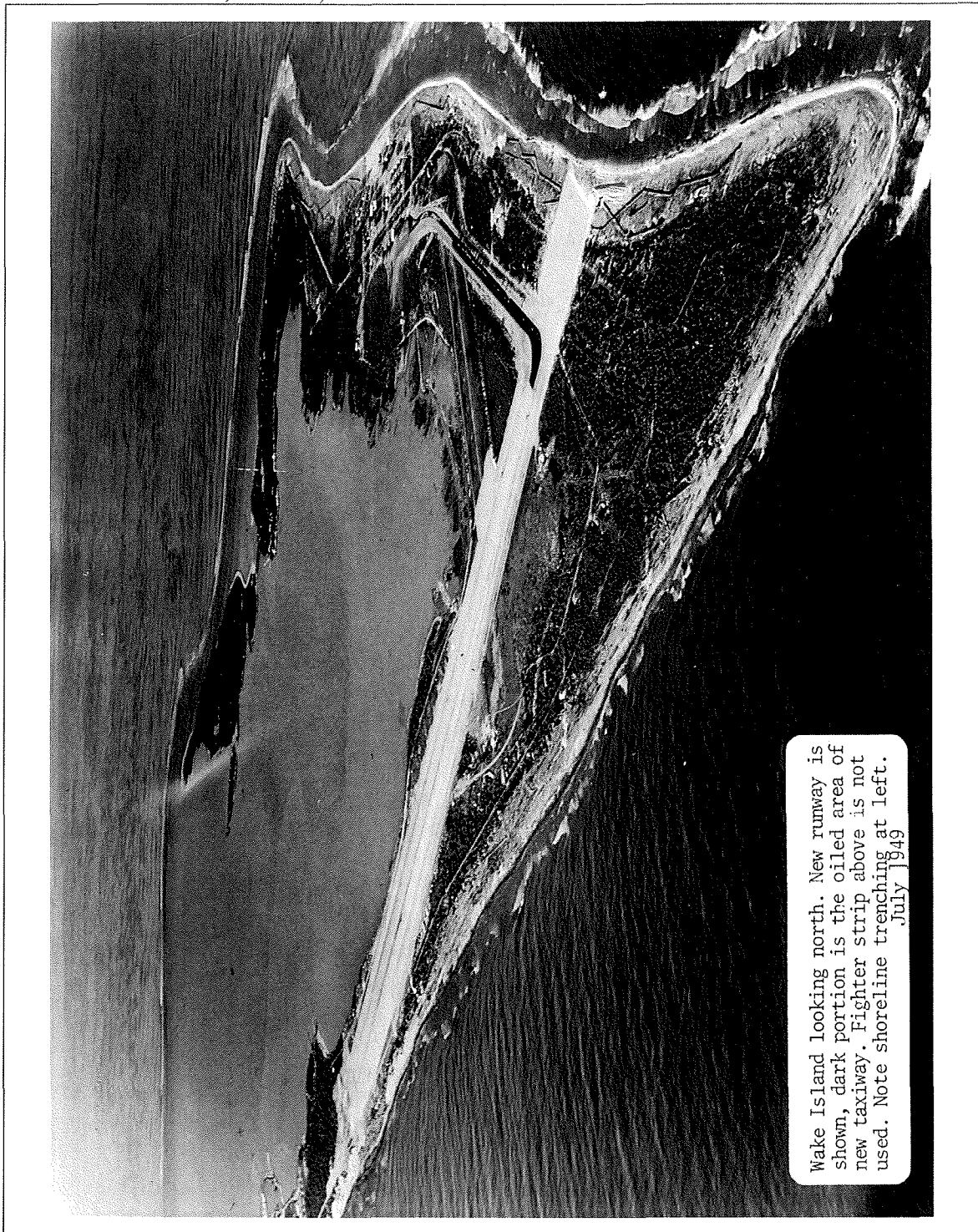
Wake Island looking north- New receiver control station and Pan Am Housing can be seen upper center.
July 1949

WAKE ISLAND
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Figure 13: July 1949, Oblique Photograph of Wake Atoll, looking north.

(Source: Historical Archives Collection (U.S. Air Force), 15th Wing History Office, Joint Base Pearl Harbor-Hickam, Hawai'i)



Wake Island looking north. New runway is shown, dark portion is the oiled area of new taxiway. Fighter strip above is not used. Note shoreline trenching at left.
July 1949

Figure 14: December 1949, View of Japanese-built defensive trenches typical on Atoll.
(Source: Historical Archives Collection (U.S. Air Force), 15th Wing History Office, Joint Base Pearl Harbor-Hickam, Hawai'i)

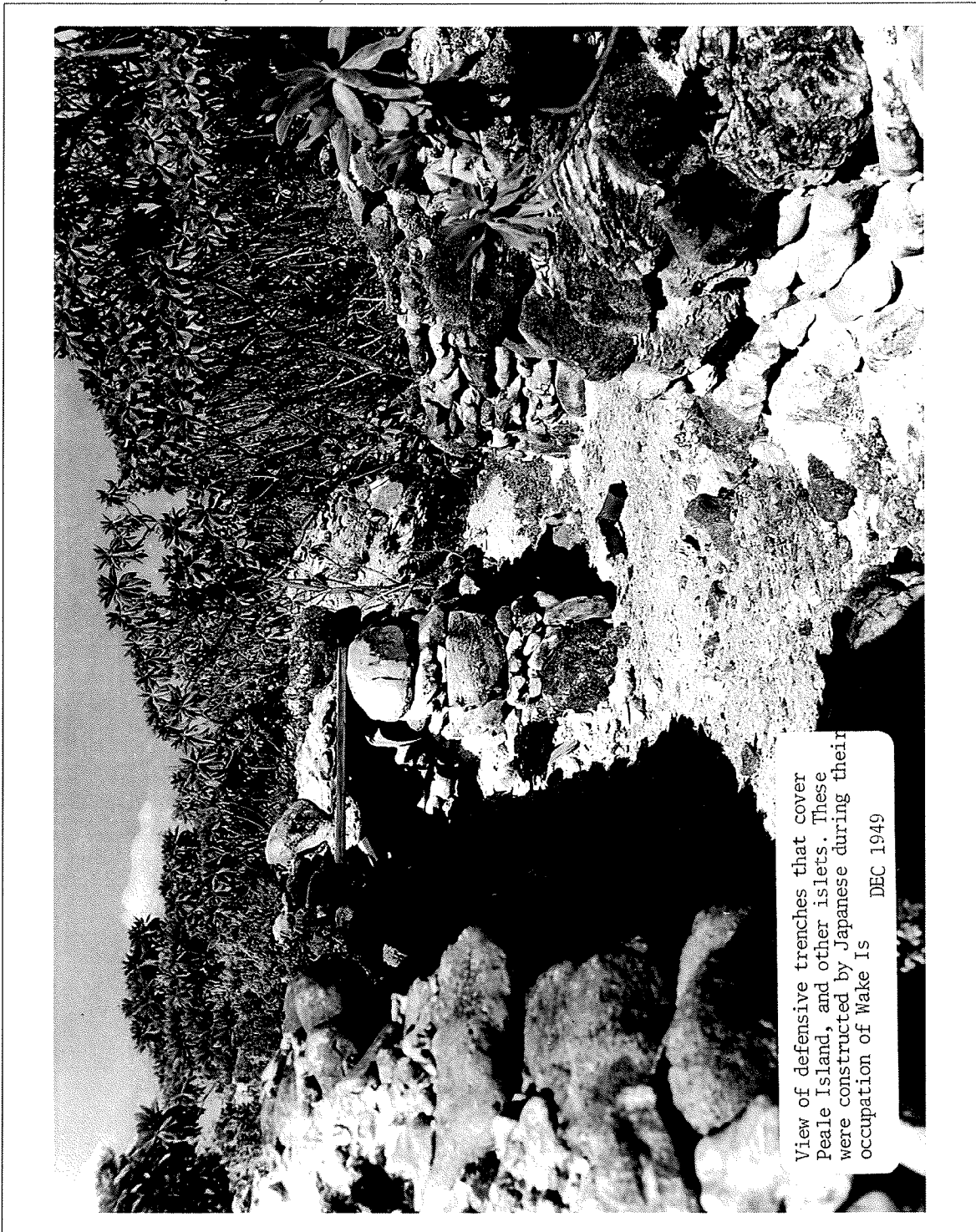
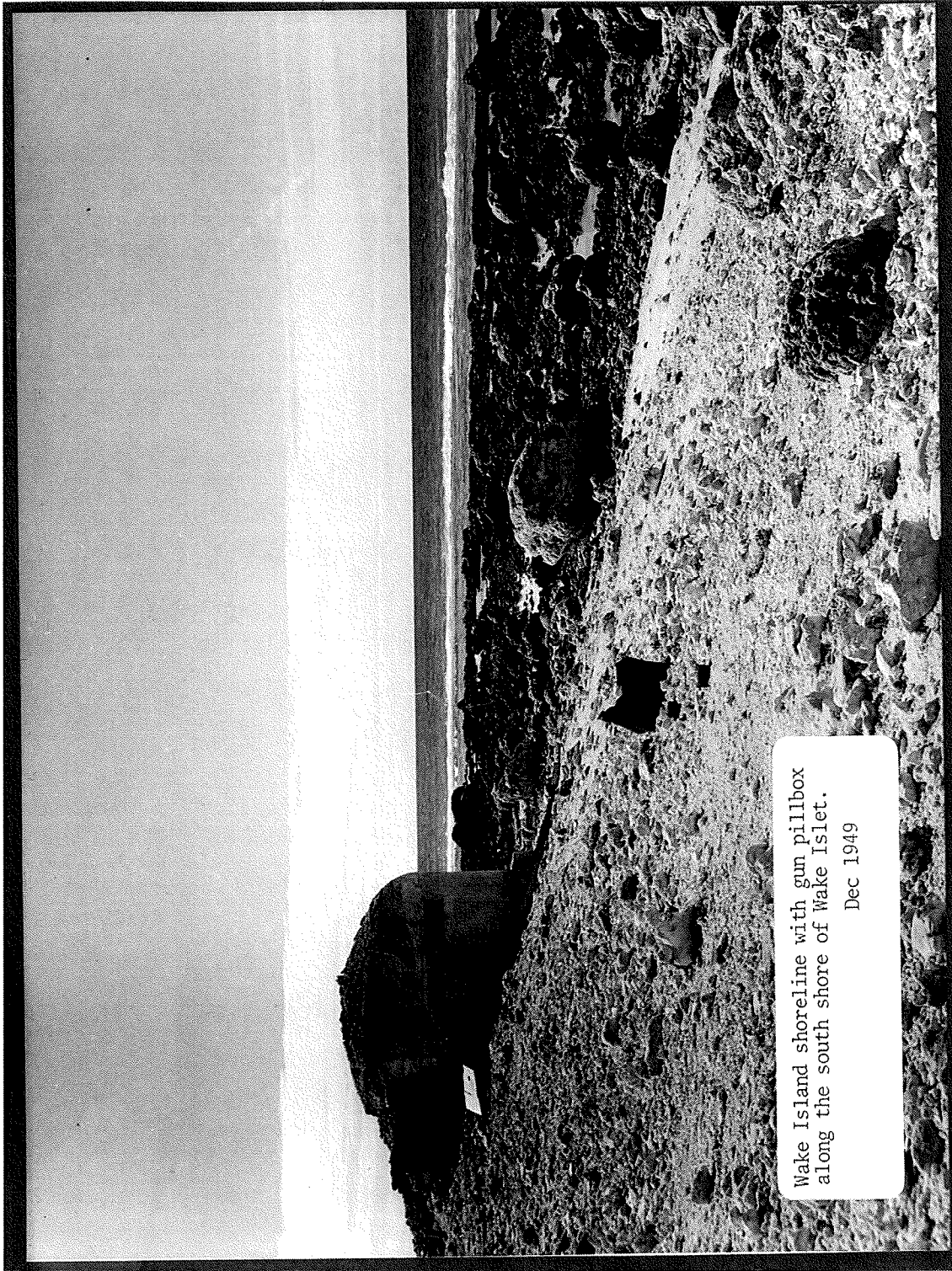


Figure 15: December 1949, semi-circular blockhouse on south shore of Wake Island
(Source: Historical Archives Collection (U.S. Air Force), 15th Wing History Office, Joint Base Pearl Harbor-Hickam, Hawai'i)



Wake Island shoreline with gun pillbox
along the south shore of Wake Islet.

Dec 1949