

MARINE TURTLES OF U. S. TERRITORIES  
IN THE CENTRAL PACIFIC OCEAN

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## Introduction

Except for the Hawaiian Islands which have been covered in a separate document, the marine turtles at areas under U. S. jurisdiction in the Central Pacific Ocean have not been systematically investigated and only limited, diffuse information exists on their occurrence and status (Balazs, 1978, 1979). The purpose of this report is to consolidate and review all of the available published and unpublished information in order to provide a basis for future investigations.

Of the Central Pacific areas covered in this report, only the islands of American Samoa have an indigenous human population. However, like most areas throughout Polynesia, the present cultural importance of marine turtles to these people has not been determined (see Johannes, 1978). While the other U. S. territories in the Central Pacific are either uninhabited or occupied only by military personnel, turtles that utilize these areas could very well be involved in migratory patterns that encompass inhabited Pacific islands outside of U. S. jurisdiction. It is therefore imperative that tagging studies eventually be carried out to determine the extent to which international movements are taking place.

Under provisions of the U. S. Endangered Species Act that became effective in September 1978, green (*Chelonia mydas*), olive ridley (*Lepidochelys olivacea*) and loggerhead (*Caretta caretta*) turtles that occur at areas under U. S. jurisdiction are fully protected. The hawksbill (*Eretmochelys imbricata*), leatherback (*Dermochelys coriacea*) and Kemp's ridley (*Lepidochelys kempi*) have received this protection since 1970 (U. S. Department of Commerce, 1978).

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### Status of Marine Turtles and Habitat

#### Johnston Atoll

Johnston Atoll is located at 16°45'N, 169°31'W and consists of four islands within a 170 km<sup>2</sup> submerged coral platform where ocean depths are less than 30 m. Two of the islands (Akau and Hikina) are completely man-made, while the other two (Johnston and Sand) are natural islands that have been artificially enlarged. These dredge and fill operations by military agencies have periodically taken place over the past 45 years, with a resulting increase in total land area from the original 23 ha to the present 343 ha. A 2750 m aircraft runway is located on Johnston Island. From the late 1950's until 1962 nuclear weapons testing took place in the atmosphere over the atoll. The area is still controlled by the Nuclear Defense Agency, but is now used principally as a storage site for chemical munitions. In addition, a Coast Guard Loran Station is located on Sand Island. A small human population resides at the atoll to maintain these facilities. In 1926 Johnston Atoll was designated as a federal bird refuge due to the presence of large colonies of nesting seabirds. The area is therefore concurrently managed by the U. S. Fish and Wildlife Service as part of the National Wildlife Refuge System (U. S. Department of the Interior, 1976a). The closest island to Johnston is French Frigate Shoals in the Northwestern Hawaiian Islands, a distance of 835 km to the north-northwest. Additional comprehensive

information on the biological and historical aspects of the atoll has been presented by Amerson and Shelton (1976).

Both immature and adult green turtles occur at Johnston Atoll, but nesting has never been documented. Courtship behavior and apparently sustained copulation have, however, been periodically observed by resident personnel. Most of the sightings of turtles are made in the shallow waters along the southern and western shores of Johnston Island where foraging regularly takes place. Numerous species of benthic algae occur within the atoll (Buggeln and Tsuda, 1966), including *Caulerpa racemosa*, *Codium arabicum* and *Gelidium pusillum* which are known to be food sources of green turtles in the Hawaiian Islands. From 10 to 12 foraging turtles can be seen near Johnston Island throughout the year. However, the daily exchange rates and total number of individuals involved are unknown.

In November of 1966 personnel of the Smithsonian Institution collected an adult green turtle "on the beach of Sand Island" for use as a museum specimen (Amerson and Shelton, 1976). It is unknown if this was a natural mortality that had been salvaged, or a live turtle that possibly was exhibiting the rare behavioral trait of basking ashore, such as occurs at undisturbed sites in the Northwestern Hawaiian Islands.

From 1962 to 1976 one of the residents of Johnston Island reported catching between 6 and 15 turtles a year, the largest of which weighed 138 kg. None of these turtles were found to have tags. This is significant in view of the large number of green turtles that have been tagged in the Hawaiian Islands, particularly at the colonial breeding site of French Frigate Shoals (Balazs, 1979). The method of capture involved snagging the turtles in the neck or flippers with a hook and line cast from shore. On one such occasion a large

shark, possibly a tiger shark (*Galeocerdo cuvier*), attacked and ate a struggling turtle before it could be retrieved. Several sharks were also seen feeding on a large turtle outside the fringing reef on the northwestern side of the atoll.

Since 1976 the capture of turtles at Johnston Atoll has been prohibited under refuge regulations issued by the U. S. Fish and Wildlife Service. Observations of turtles by resident personnel are being communicated to the author through the use of standardized sighting report forms.

#### Kingman Reef

Kingman Reef is located 1575 km to the southeast of Johnston Atoll at 6°23'N, 162°18'W. The area consists of an 8 by 15 km triangular reef sheltering a lagoon with depths to 82 m. A single small coral island is situated at the western end (Bryan, 1942, see also Krauss, 1970). Kingman Reef is administered by the U. S. Navy and entry is prohibited under its designation as a Naval Defensive Sea Area and Air Space Reservation. The area is apparently used for Navy training exercises involving nuclear submarines and underwater detection systems.

No information is known to exist on turtles or any other marine biological aspects of Kingman Reef.

#### Palmyra

Palmyra is an atoll containing 50 well-vegetated coral islands located 60 km southeast of Kingman Reef at 5°53'N, 162°05'W. The total land area is approximately 100 ha. Since 1929 Palmyra has been privately owned by the Fullard-Leo family (Bryan, 1942, Inder, 1978). During World War II the U. S. Navy joined several of the islands together by dredging, and an 1800 m aircraft

runway was constructed. Black rats (*Rattus rattus*) were apparently introduced during the military's tenure. The atoll is presently used as a copra plantation and has a small resident human population consisting in part of natives from Kiribati (formerly the Gilbert Islands). Large colonies of seabirds nest on some of the islands. In June of 1979 the U. S. Government announced that Palmyra was one of three Pacific islands being considered as a storage site for nuclear wastes (Scott, 1979, Shapiro, 1979, Wilson, 1979, Anonymous 1979).

During visits made from 1958 to 1965, green turtles were periodically sighted in shallow waters on the eastern side of Palmyra (P. Helfrich, personal communication). On one of these visits J. Naughton (personal communication) observed 11 adult turtles foraging together at one time. There are no reports of nesting.

#### Jarvis

Jarvis is located 730 km southeast of Palmyra at 0°23'S, 160°01'W. This sparsely vegetated coral island consists of 445 ha with a fringing reef 100 m from shore. A small shoal occurs off the east side. From 1857 to 1879 the island was mined for guano. From 1935 to 1942 Jarvis was again inhabited by a small number of people for the purpose of reestablishing U. S. ownership. Cats were introduced at that time and a large population now exists (King, 1974, U. S. Fish and Wildlife Service, personal communication). No evidence of Polynesian ruins or artifacts was found during an archaeological survey conducted in 1924 (Emory, 1934). In 1974 the island was designated as a National Wildlife Refuge (U. S. Department of the Interior, 1976b). Large colonies of nesting seabirds are present.

A low level of nesting, apparently involving green turtles, was recorded along the west coast of Jarvis by residents present in August of 1935. A large turtle estimated to weigh 225 kg was also seen inside the fringing reef during October of 1935 (Bryan, 1974). No other information on turtles is known to exist for Jarvis. It should be noted, however, that at some marine turtle nesting areas feral cats are known to prey on both eggs and hatchlings (Stancyk, in press).

#### Howland

Howland is a sparsely vegetated coral island consisting of 162 ha located at 0°48'N, 176°38'W. A narrow fringing reef surrounds the entire island and large colonies of nesting seabirds are present. From 1858 to 1891 the island was mined for guano, and from 1935 to 1942 a small human population was in residence to reestablish U. S. ownership. In 1937 an aircraft runway was constructed for Amelia Earhart. During World War II the island was extensively used by the U. S. military (Bryan, 1942, Inder, 1978). A small population of cats currently exists on the island (U. S. Fish and Wildlife Service, personal communication). The presence of a few archaeological sites and stone paths indicates that the island was inhabited or at least visited by early Polynesians (Emory, 1934). In 1974 Howland was designated as a National Wildlife Refuge (U. S. Department of the Interior, 1976b).

Turtles of an unstated species were reported to be "abundant" in the waters around Howland during May and June of 1935 (Bryan, 1974). No other information on turtles is known to exist for Howland.

#### Baker

Baker is a sparsely vegetated coral island located 67 km southeast of Howland at 0°13'N, 176°28'W. The island consists of 135 ha with a narrow



fringing reef. Like Howland, Baker was mined for guano during the late 1800's, had a small resident human population from 1935 to 1942, and was heavily used by the U. S. military during World War II (Bryan, 1942, Inder, 1978). Cats were also introduced and it is thought that their presence has prevented the recovery of nesting seabird colonies (King, 1973). In 1974 Baker was designated as a National Wildlife Refuge (U. S. Department of the Interior, 1976b).

No information on turtles is known to exist for Baker. Baker is only 330 km north of Canton, an important nesting site for green turtles and the northern-most island in the Phoenix group (Balazs, 1976).

#### American Samoa

##### Tutuila and Manua Group

Tutuila (14°16'S, 170°40'W) consists of 135 km<sup>2</sup> and is the largest island in American Samoa. Approximately 94% of the 31,000 inhabitants of the island group reside at this location. The small island of Aunuu is situated a short distance off the southeastern coast. The Manua Group is located 110 km to the east of Tutuila and is comprised of three islands, Tau (44 km<sup>2</sup>), and Olosega and Ofu (13 km<sup>2</sup>) which are contained within the same fringing reef. All five of these islands are of volcanic origin with mountainous interiors and limited coastal plains (Inder, 1978).

Both green and hawksbill turtles occur in the waters surrounding these islands, but apparently only in small numbers. There is some indication that the hawksbill may be the most common species. Sporadic nesting on isolated beaches is thought to take place (Coffman, 1977, Dodd, 1978, S. Swerdloff, H. Sesepasara and R. Wass, personal communications).

### Swains Island

Swains Island is located 370 km north of Tutuila at 11°03'S, 171°05'W. The island is 2 km in diameter and consists of a continuous ring of coral surrounding a lagoon of depths to 15 m with no surface connection to the ocean (Bryan, 1942). Swains has been used as a copra plantation since 1841 when it was colonized by natives from Fakaofu in the Tokelau Islands. Since 1856 Swains has been privately owned by the Jennings family (Bryan, 1974, Inder, 1978).

Both green and hawksbill turtles are reported to nest at Swains (Dodd, 1978, S. Swerdloff, personal communication). Turtle eggs were observed being gathered by the native inhabitants during July and August of 1963 (H. Seseapasara, personal communication).

### Rose Atoll

Rose Atoll, one of the smallest atolls known, contains two islands and is located 145 km east of Tau at 14°33'S, 168°09'W. The nearly square reef (3.2 by 3.7 km) is composed principally of the pink coralline alga, *Lithothamnion*, which shelters a lagoon with depths to 15 m. The larger of the two islands, Rose Island, is approximately 320 m long by 230 m wide and contains a dense forest of *Pisonia grandis*. Some of these trees are up to 26 m high. Large colonies of seabirds nest on Rose Island. The smaller island, Sand Island, is 185 m long by 45 m wide and devoid of vegetation. Rose Atoll is uninhabited and has been a National Wildlife Refuge since 1974 (U. S. Department of the Interior, 1976b). An aerial color photograph of the atoll appeared in a *National Geographic* article by Rockefeller and Rockefeller (1974). Additional information on the biological and historical aspects of the area has been compiled by Bryan (1942) and Sachet (1954).

Green turtles, and probably some hawksbills, presently nest on both islands at Rose Atoll. An early account stated that large numbers of turtles nest during August and September, and that when hatching takes place numerous sharks prey on the young turtles as they pass through the surrounding waters (Graeffe, 1873 quoted by Sachet, 1954, Weins, 1962 and Hirth, 1971). In another early account a turtle captured within the atoll was found to have been feeding extensively on the green alga *Caulerpa* (Girard, 1858).

During a one day visit on 7 October 1970, Hirth (1971) counted 35 and 301 nesting pits of varying age on Sand and Rose Islands, respectively, but no turtles nested that night. Many of these pits may have represented abandoned nesting attempts. On Rose Island the beach was found to be composed of coral fragments, thereby suggesting to Hirth (1971) that nesting in such substrate must be a "formidable task." Hirth (1971) also reported that fishermen in Pago Pago (Tutuila) had told him that the nesting season at Rose Atoll was between August and September.

During a low-level aerial reconnaissance in October of 1974, 75 adult turtles were counted within the lagoon (P. Sekora, personal communication).

During a five day visit in May of 1976, only three adults and one immature green turtle were observed in the lagoon and no nesting took place. However, old pits were found on both islands (Coffman, 1977).

During a daytime visit on 29 March 1978, Coleman (1978) recorded one recently excavated pit on Rose Island and four that were thought to be about one month old. Other older pits were noted, as well as a single adult green turtle in the lagoon and some rib bones on Sand Island. Numerous black-tipped sharks 20 to 40 cm long were seen around Rose Island.

On 3 November 1978 passengers from the M. S. Lindblad EXPLORER visited Rose Atoll and observed numerous nests along the beach of Rose Island. Sand

Island was found to be "literally covered with turtle nests, perhaps 100-150." However, only two green turtles and one hawksbill were reported by divers in the lagoon (T. Ritchie, *in litt.* to J. B. Giezantanner).

The impact of rats on hatchling turtles at Rose Island warrants some attention. Direct observations of predation have been made during recent years (S. Swerdloff, personal communication), but the extent and significance are currently unknown. Mayor (1921) was the first author to record rats on the island, which he described as being small, gray-brown in color, tame and very abundant during a visit in 1920. Sachet (1954) assumed that this was the Polynesian rat (*Rattus exulans*), however specimens deposited at the Bernice P. Bishop Museum in Honolulu were never identified (see Ewing, 1924). Hirth (1971) stated that Rose Island "swarms with rats (possibly *Rattus exulans*)." Coleman (1978) found that rats were "extremely abundant" in the center part of the island under the *Pisonia* trees. Rather than the Polynesian rat, this investigator thought that black rats might be present. Four traps were set but no captures were made. Two passengers of the M. S. Lindblad EXPLORER reported seeing four "rat-like mammals" during their short visit. T. Ritchie *in litt.* to J. B. Giezantanner stated the following: "The animals ranged from light brown to golden in color, and both people thought they may have had a loose fold of skin between the forelimb and hindlimb on each side (not unlike that found on flying squirrels). The structure of their tails was not positively noted. They were described as being about the size of large mice."

Both islands at Rose Atoll are currently being reviewed by the U. S. Fish and Wildlife Service for possible designation as Critical Habitat for marine turtles under the Endangered Species Act (Dodd, 1978).

## Wake

Wake is a triangular atoll consisting of three islands located at 19°18'N, 166°35'E. The nearest land is Taongi Atoll in the northern Marshall Islands, a distance of 600 km to the south. Prior to 1935 Wake was uninhabited except for visitations by Japanese seabird feather hunters. In 1935 an aircraft runway, refueling facility and hotel were constructed by Pan American Airways. The three islands (Wake, Wilkes and Peale) were later joined together by bridges and roads to form a usable land area of 650 ha. The lagoon is less than 4 m deep and partially exposed to the open ocean on the northwestern side. During World War II the Japanese military occupied Wake from December 1941 to September 1945 (Bryan, 1942, Inder, 1978). The Fifteenth Air Base Wing of the U. S. Air Force currently has jurisdiction over the atoll and approximately 200 personnel reside at the facilities. Wake is one of the islands being considered as a storage site for nuclear wastes (Shapiro, 1979).

Both immature and adult green turtles occur in the lagoon and along the outside perimeter of the atoll. However, nesting has never been recorded. Turtles are frequently observed foraging in the narrow channel between the islands of Wake and Peale. In July of 1976 an immature green turtle was found at Wake that had been tagged six months earlier at Midway, a distance of 1900 km. However, the weak condition of this turtle, both at the time of tagging and at recovery, suggests that it may have passively drifted to Wake with prevailing winds and currents.

Standardized report forms are being used by resident personnel on Wake to communicate information to the author on the sightings of turtles.

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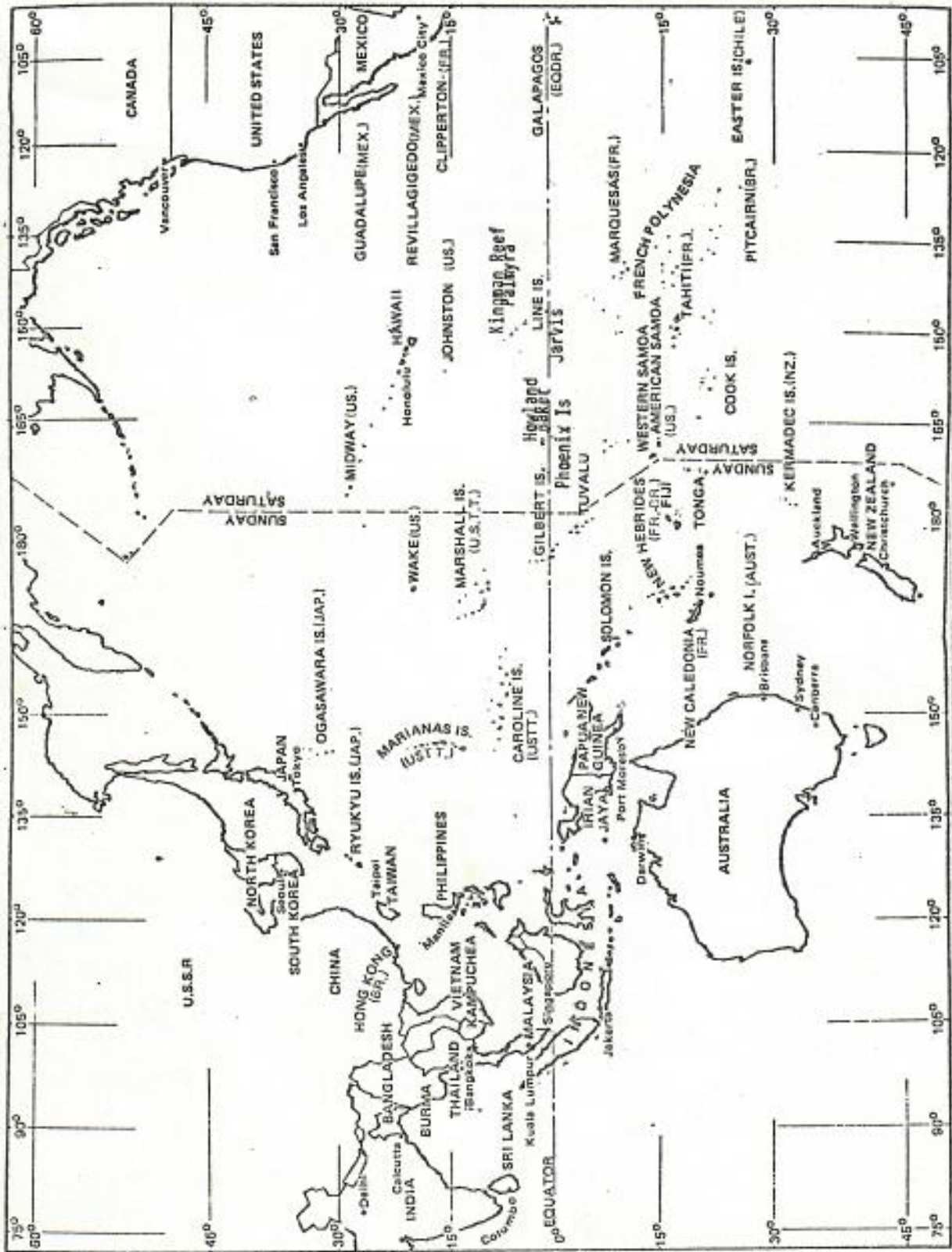


Figure 1. Pacific Ocean (from Inder, 1978).

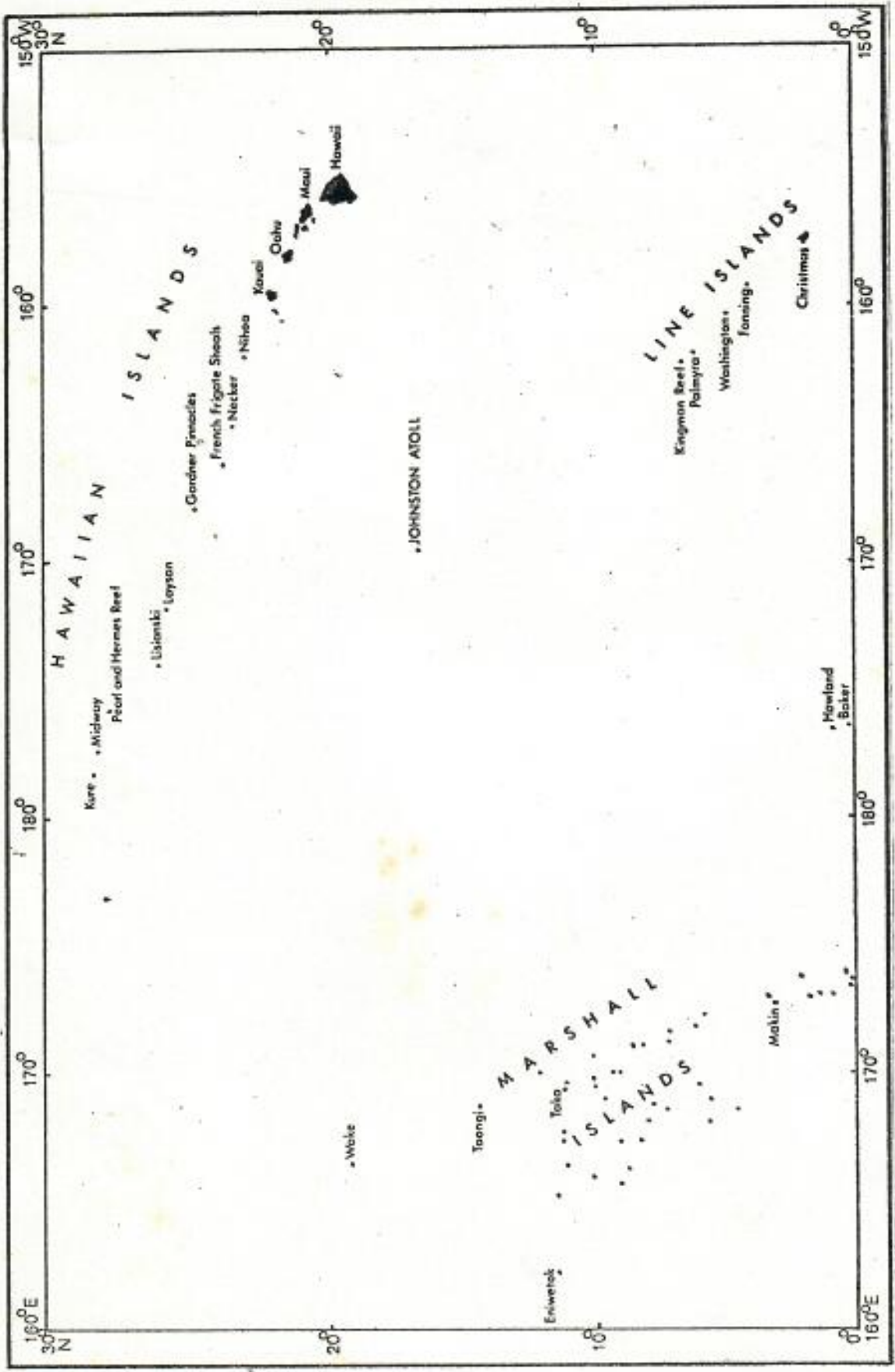


Figure 2. North Central Pacific Ocean (from Amerson and Shelton, 1976).