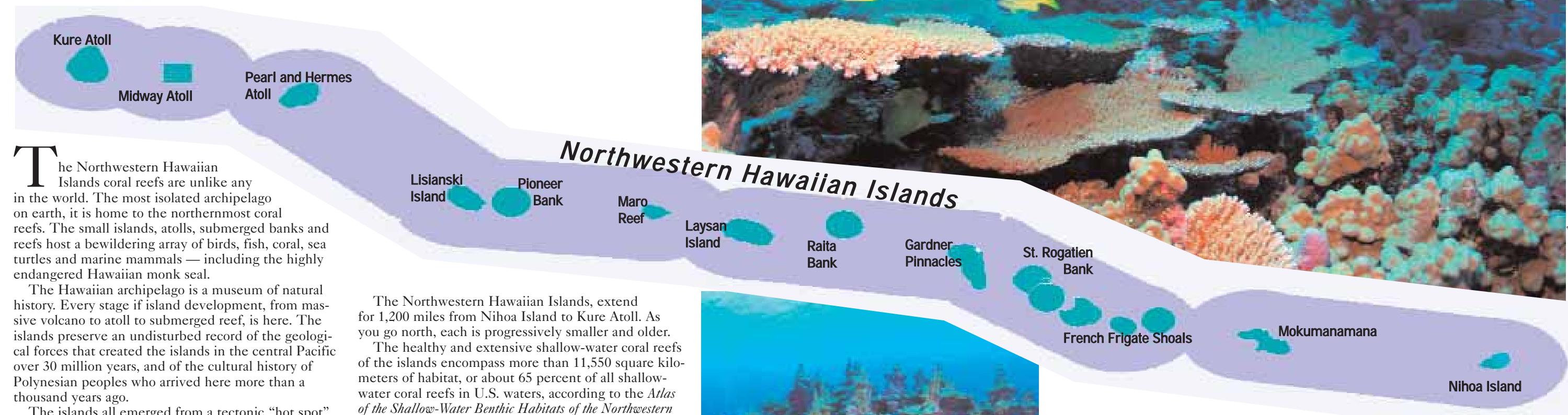


Isles of coral

Exploring the Northwestern Hawaiian Island Coral Reef Ecosystem Reserve



The Northwestern Hawaiian Islands coral reefs are unlike any in the world. The most isolated archipelago on earth, it is home to the northernmost coral reefs. The small islands, atolls, submerged banks and reefs host a bewildering array of birds, fish, coral, sea turtles and marine mammals — including the highly endangered Hawaiian monk seal.

The Hawaiian archipelago is a museum of natural history. Every stage of island development, from massive volcano to atoll to submerged reef, is here. The islands preserve an undisturbed record of the geological forces that created the islands in the central Pacific over 30 million years, and of the cultural history of Polynesian peoples who arrived here more than a thousand years ago.

The islands all emerged from a tectonic “hot spot” now located some 20 miles southwest of the Big Island where a new island, Lo’ihi, is being formed. They are being carried by the motion of the Pacific Plate at about 10 centimeters per year

The Northwestern Hawaiian Islands, extend for 1,200 miles from Nihoa Island to Kure Atoll. As you go north, each is progressively smaller and older. The healthy and extensive shallow-water coral reefs of the islands encompass more than 11,550 square kilometers of habitat, or about 65 percent of all shallow-water coral reefs in U.S. waters, according to the *Atlas of the Shallow-Water Benthic Habitats of the Northwestern Hawaiian Islands*, published by NOAA in 2003.

The reefs support 57 species of hard and soft coral. Unlike the Main Hawaiian Islands, where alien algae have overgrown many coral reefs, the reefs in the northwestern islands are free of this intruder, a major reason why scientists describe the ecosystem as “pristine.”

Another striking aspect to the Northwestern Hawaiian Islands is the dominance of large predators, such as sharks and jacks.

In the Main Hawaiian Islands, top carnivores represent only 3 percent of the total fish biomass, with the rest lost heavy fishing.

But in the northwestern islands, the big fish consist of 54 percent of all fish biomass.

“The reefs in the NWHI are among the few large-scale, intact, predator-dominated reef ecosystems remaining in the world and offer an opportunity to examine what could occur if larger more effective



Spectacled Parrotfish at Kure Atoll. Courtesy NOAA

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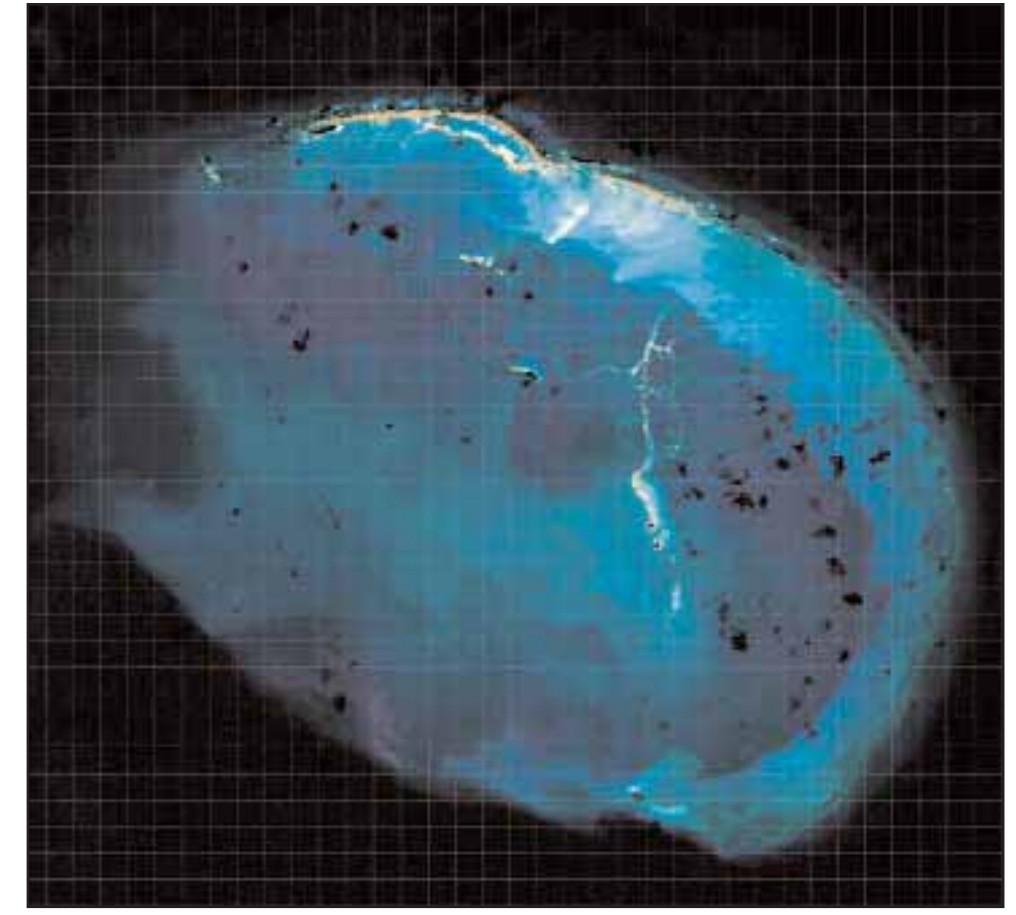


Courtesy James Watt



Courtesy James Watt

Lobe corals are growing in huge colonies in the northwestern islands, while around the world coral reefs are threatened or in decline



FRENCH FRIGATE SHOALS FROM THE SKY AND BENEATH THE WAVES

The photograph above of French Frigate Shoals was taken by Ikonos, a space satellite. The light green colors indicate islands and reefs that are above water. They encircle an ancient volcano that has sunken beneath the sea. The underwater photograph at left shows reef fish swimming among table corals. French Frigate Shoals is the main breeding area for the highly endangered Hawaiian monk seal. The monk seal population has been declining since the late 1980s in part because of starvation.

Shipwrecks, marine debris and alien invaders

When a ship wrecks in the Northwestern Hawaiian Islands, it does more than leave a hulking piece of metal on the reefs. It can also introduce alien species, potentially causing enormous damage.

There have been at least 52 shipwrecks in the Northwestern Hawaiian Islands, including rafts, whaling vessels, navy frigates, tankers, and modern fishing boats. Only 12 vessels have been located.

When anchors, especially the enormous anchors of cruise ships, are carelessly dropped and dragged on fragile reef, hundreds of meters of habitat can be destroyed.

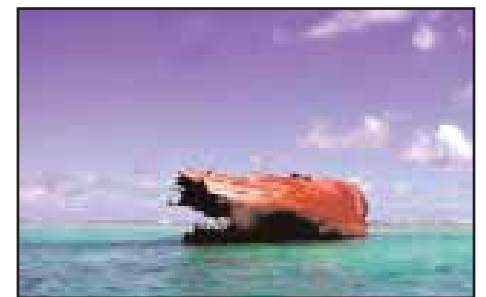
Fishing vessel shipwrecks like the Hoi Maru #5 and Paradise Queen II at Kure Atoll, or the tanker Mission San Miguel, lost at Maro Reef, pose serious threats to reef ecosystems.

In 1998, the Paradise Queen II, one of six active NWHI lobster vessels, wrecked and discharged 4,000 to 5,000 gallons of diesel fuel into the water. Two

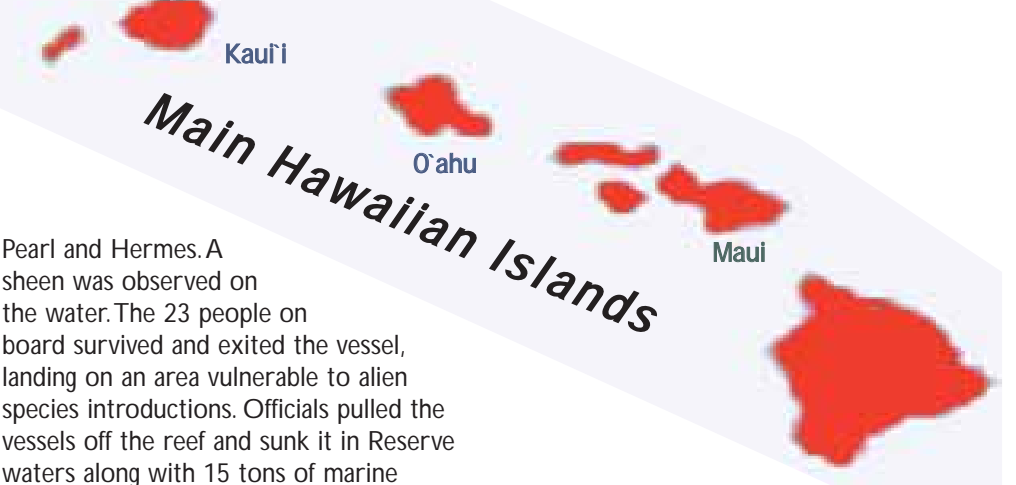
years later, a research team found the bodies of two monk seals among piles of nets near the decaying wheel house on the beach. The researchers also found coral damage from abandoned lobster traps and lead weights.

In June 2000, the 85 foot longliner, Swordsman II, shipwrecked at Pearl and Hermes Reef, one of the main monk seal pupping sites. More 2,200 gallons of fuel is spilled. Longliners have not been allowed to fish within 50 miles of the northwestern islands since 1991.

In July, 2005, the Casitas, a 145-foot vessel contracted by NOAA for marine debris removal, slammed into reefs at



Paradise Queen II



Pearl and Hermes. A sheen was observed on the water. The 23 people on board survived and exited the vessel, landing on an area vulnerable to alien species introductions. Officials pulled the vessels off the reef and sunk it in Reserve waters along with 15 tons of marine debris still on board the vessel. The \$5 million estimated clean-up cost was equivalent to the annual expense of managing the entire 84 million acre Reserve. The Reserve Advisory Council for the Coral Reef Ecosystem Reserve has, for many years, proposed mandatory Vessel Monitoring Systems for all vessels in the region, to provide notification to enforcement and monitoring agencies, as well as as the ship's captain, whenever a vessel approaches closed or protected areas, banks, reefs, or land. Such a system could well have prevented the more recent shipwrecks.

MAP: The Northwestern Hawaiian Islands Coral Reef Ecosystem

The federal boundaries of the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve, located 3 to 50 miles from shore.

State of Hawai'i waters in the northwestern islands, located 0 to 3 miles from shore. They are closed to all fishing and commercial activities.

