

Humpback Whales in Hawaii: Vessel Census, 1976

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ABSTRACT—Three hundred seventy-three humpback whales, *Megaptera novaeangliae*, were seen around the main Hawaiian Islands during a vessel survey from 24 February to 6 March 1976. Indications are that this population represents a different stock from that summering in southeastern Alaska. No humpback whales were seen during a subsequent monk seal survey off the Leeward Islands.

INTRODUCTION

Humpback whales, *Megaptera novaeangliae*, wintering in Hawaiian waters, were surveyed by the Marine Mammal Division (MMD) of the National Marine Fisheries Service's (NMFS) Northwest and Alaska Fisheries Center in Seattle, Wash. The survey was undertaken from 24 February to 8 March 1976 to determine the distribution and abundance.

All humpback whale populations have become so diminished that the International Whaling Commission has prohibited their capture worldwide since 1966. The humpback whale has been on the U.S. Government's endangered species list since 1970.

Based on sighting surveys on the humpback's wintering grounds off Mexico (Rice, 1974) and its summering grounds from the Aleutians to the Chukchi Sea (Wada, 1975), it appears that there are no more than a few hundred animals east of long. 140°W. However, the entire North Pacific Ocean population numbers about 1,200 animals (Wada¹; Gambell, 1976), and Wada (1975) indicated that sighting indices suggest that stock sizes are increasing. The worldwide population is estimated at about 5,200 (Federal Register, 1975) to 7,000 (Scheffer, 1976).

According to Nishiwaki (1966), there were formerly many humpbacks in eastern Aleutian and western Alaskan peninsula waters and six marked whales had moved from the east end of the Aleutian chain to the Ryukyu Island area. According to sightings by Berzin and Rovnin (1966), the largest number (75 percent) occurred during the summer from the eastern Aleutians to Unimak Strait. From 1925 to 1927, 3,037 humpback whales were caught in the North Pacific (Committee for Whaling Statistics, 1931). In 1962 and 1963, 3,115 humpbacks were taken in eastern Aleutian waters between lat 50° and 60°N and between long 150° and 170°W, according to catch statistics circulated by the North Pacific Working Group, Scientific Committee, International Whaling Commission.

In the eastern North Pacific Ocean, the humpback whale ranges from the Chukchi Sea south to southern California during the summer. Humpback whales are found as far south as Jalisco, Mexico, as well as near the Hawaiian Islands during the winter. The species is a tourist attraction in Hawaii and southeastern Alaska.

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METHODS

Vessel Census

The survey was conducted from the MV *Easy Rider* (Fig. 1), a 76-foot (23-m) aluminum fishing vessel with a cruising speed of 8.5 knots (16 km/h).

Figure 1.—Description of the MV *Easy Rider*.

MV <i>Easy Rider</i>	
Construction:	All aluminum, built in 1971. Length, 76 feet; beam, 23.9 feet; draft, 4 to 3 feet. Galley, four staterooms (2 beds and head in each).
Power:	Two V8-71 GMC diesel main engines. Two 30 kw 240 V4 phase 2.71 GMC diesel generators. One hydraulic crane, 2,400-pound capacity at 14½ feet reach.
Cruising speed:	Average 10 knots
Fuel capacity:	10,219 gallons
Range:	4,000 miles
Water capacity:	500 gallons plus evaporator making 20 gallons per hour when main engine is in use.
Cargo capacity:	30 tons of refrigerated or 35 tons dry
Electronics and Radio gear:	Sonar, radar, fathometer, loran, single side-band radio, AM marine radio, VHF radio automatic pilot.
Captain:	Gary Natfel

¹Wada, S. 1972. The ninth memorandum of stock assessment of whales in the North Pacific. Unpublished report of the Scientific Committee, International Whaling Commission, Red House, Station Road, Histon, Cambridge, CB 4 4NP, Engl.

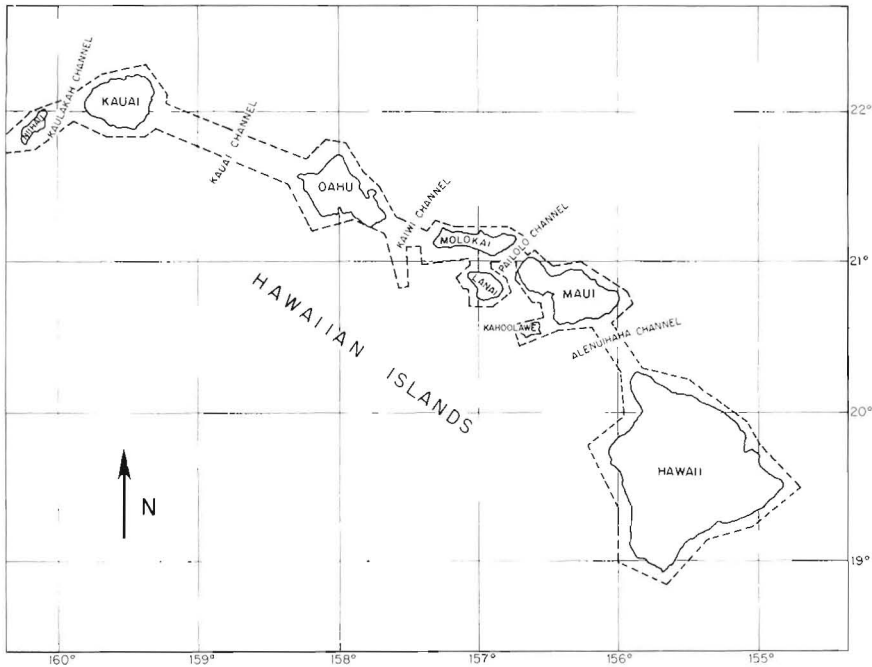


Figure 2.—Hawaiian Islands survey area; cruise track indicated by dashed lines.

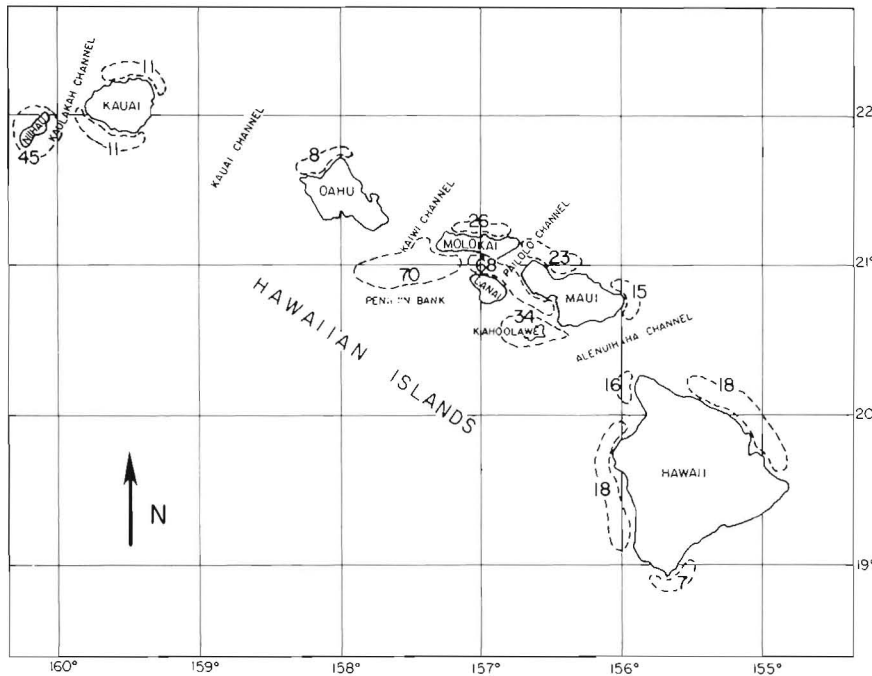


Figure 3.—Main concentrations of humpback whales seen during sighting cruise, 24 February to 6 March 1976.

The vessel circumnavigated all the main islands from Hawaii to Kauai and Niihau (Fig. 2). The cruise track closely followed the 50-fathom curve

during the trip, except when crossing inter-island channels. The ship's bridge was 15 feet (4.6 m) above the waterline. The ship's course was not diverted

to approach whales. Three observers generally spotted animals from the bridge. Prior to the vessel census, an aerial reconnaissance was made, during which it was found that many whales were distributed offshore over shallow banks between certain islands, such as Molokai, Maui, and Hawaii. The *Easy Rider* departed Honolulu, Oahu, on 24 February, cruised across Penguin Bank, and surveyed along the south and west sides of Molokai, Maui, and Hawaii. It then ran off the northern sides of Hawaii, Maui, Molokai, Oahu, and Kauai, circling Niihau and Kaula Rock, after which it returned to Honolulu along the southern edges of Kauai and Oahu on 6 March.

Aerial Photography

On 8 March (1145-1545 hours), a Cessna 206 Skywagon² was used to photograph animals in an area of dense concentration found during the vessel survey. Portions of Penguin Bank, south of Molokai; Auau Channel, between Lanai and Maui; and the area between Lanai and Molokai were flown over, and Molokai was circled.

RESULTS

Distribution and Abundance

During the 12-day cruise (about 1,100 miles or 2,040 km), 373 humpback whales were observed (Table 1). Areas of greatest concentration were Penguin Bank, the islands of Niihau, Molokai, and Maui, the eastern side of Lanai, and the northern side of Kahoolawe (Fig. 3). No humpbacks were seen during a subsequent NMFS vessel survey for monk seals off the Leeward Islands, which was carried out from 17 March to 16 April aboard the *Easy Rider*.

During the 4-hour flying time, (about 440 miles or 815 km), 38 whales were observed and photographed.

Utilizing these data to estimate abundance in Hawaiian waters is problematical. Undoubtedly, we did not see all the whales and some may even have been counted twice due to our surveying one side of the island chain several

²Reference to trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.

Table 1.—Number and location of humpback whales observed during vessel survey, 24 February to 6 March 1976.

Date	No. of whales seen	Position			
		Beginning		Ending	
		Lat. N	Long. W	Lat. N	Long. W
Feb.					
24	71	21°18'	157°52'	20°53'	157°04'
25	68	20°53'	157°04'	20°38'	156°30'
26	50	20°38'	156°30'	20°03'	155°51'
27	18	20°03'	155°51'	18°57'	155°43'
28	14	18°57'	155°43'	19°45'	155°05'
29	19	19°45'	155°05'	20°45'	155°59'
Mar.					
1	52	20°45'	155°59'	21°07'	157°19'
2	8	21°07'	157°19'	21°33'	158°16'
3	11	21°33'	158°16'	22°12'	159°31'
4	25	22°12'	159°31'	21°47'	160°13'
5	36	21°47'	160°13'	21°57'	159°51'
6	1	21°57'	159°51'	21°18'	157°51'

days after surveying the first side. This latter source of error may have been minor, though, since similar areas of concentration were found before the vessel survey and few whales were found moving between islands. If the two sources of error were equivalent, then it might be concluded that at least 373 whales are wintering in Hawaiian waters.

Of the 373 humpbacks seen, only 7 were in deep inter-island channels or in water deeper than 300 feet (92 m). The humpbacks were found most frequently in close proximity to islands, in waters 330 feet (100 m) or less in depth, and in the 100-m deep underwater peninsula extending offshore southwest of Molokai, Penguin Banks. More whales were noted on the lee than the windward side of the islands. Areas of concentration noted in early February by Jurasz during precensus flights yielded numbers of the same magnitude in early March.

Group Size and Behavior

Of 373 whales counted by ship, 281 (75.3 percent) occurred singly or in pairs (Table 2). Groups larger than five animals were not seen.

Table 2.—Number and group size of humpback whales surveyed by ship and aircraft, 24 February to 8 March 1976.

Survey vehicles	Group Size				
	1	2	3	4	5
Ship	137	144	48	24	20
Aircraft	6	10	9	8	5



Figure 4.—Full body breach by humpback whale.

Feeding was not seen, although defecation (a whitish cloud) was observed once during the vessel survey and twice during the aircraft flight, indicating that at least some feeding must have occurred.

When aircraft were employed for reconnaissance or censusing, groups of whales could be observed forming larger loose aggregations. Some pairs consisted of an adult and a calf and others, of two adults. The most dynamic surface activity observed was full body breaching (Fig. 4) and occasional "finning" or striking the water's surface with the flippers or pectoral fin.

Interaction between species was observed on 26 February. Three adult humpbacks were sighted in loose association approximately 2 miles offshore at Honoipu off the northern end of the island of Hawaii. The weather was strongly overcast with rain falling near the animals. We were first

attracted by a large splash that looked like a breach. As the vessel approached, it became apparent that the splashing was caused by an adult raking its flukes laterally across the water. Another adult was less than 10 feet (3 m) away and lying parallel to the first. From a distance of 1 mile (1.6 km), we observed that the two adults operated as a pair and were surrounded by about 100 pygmy killer whales that were milling in an apparently random pattern.

When one of the pair of humpbacks dove, a pair of dolphins dove synchronously less than 6 feet (2 m) away from the corners of the humpback's mouth, one on either side. When the companion dove, a pair of dolphins also dove on either side of it just forward of the dorsal fin. During this attendance, five dolphins lay at rest in echelon at the surface, while others swam as isolated animals in random directions, apparently taking random breaths. When the

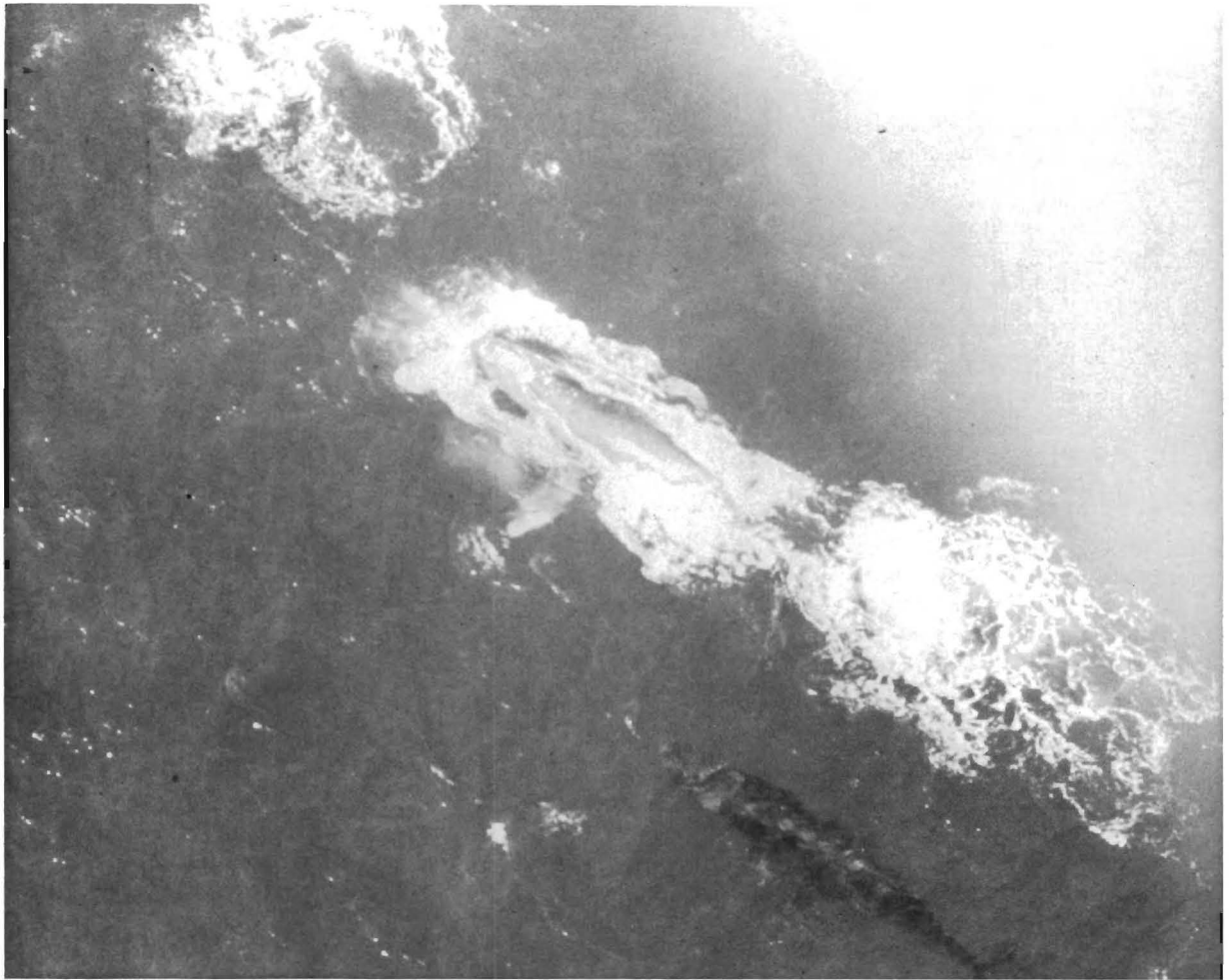


Figure 5.—Aerial view of humpback whales underwater. Note both animals with white dorsally on flippers and animals with black.

pair of humpbacks moved, the dolphins also moved—not initiating direction but quickly responding to it. On several occasions the dolphins were observed and photographed in a “mock” breaching position, i.e., in a pattern mimicking a humpback’s half-body breaching, exposing the body vertically half out of the water and falling onto the dorsal side. These activities lasted while we watched for about 20 minutes and continued as we left.

Color Phases

Lack of white dorsal surfaces on humpback whale flippers can be used to identify certain populations. Of the animals seen during the census, over one-third had all or mostly white dorsal

“flipper” surfaces that were highly visible (Fig. 5). Humpback whales that summer in southeastern Alaska have white coloration only on a small portion of the dorsal surface of the pectoral appendages; this group, therefore, was not from southeastern Alaska. It is not known where Hawaiian animals spend the summer.

Interference With Whales

Interference with the normal activities of whales appears to be a growing problem in Hawaii. During the month prior to the vessel census, five organizations or individuals were operating or scheduled to begin operations from Maui, using vessels to record and photograph the humpback

whales at close quarters. During the census small high-speed craft were observed racing through areas with cows and calves. One instance of apparent deliberate interference was recorded and reported to NMFS enforcement personnel. Interference with these whales appears to be increasing and may soon be as prevalent as that involving gray whales off San Diego, Calif. (Carl L. Hubbs, pers. commun.).

Other Cetaceans

Other cetaceans sighted on the cruise included *Steno bredanensis*, *Stenella attenuata*, *Stenella longirostris*, *Pseudorca crassidens*, *Feresa attenuata*, *Tursiops truncatus*, *Stenella*

Table 3.—Cetacean species, other than humpback whales, observed during vessel census, 24 February to 6 March 1976.

Date	Time	Species	No.	Position	
				Lat. N	Long. W
Feb.					
25	0725	<i>Steno bredanensis</i>	8	20°53'	157°03'
25	0820	<i>Stenella attenuata</i>	50±	20°45'	157°00'
26	1605	<i>Feresa attenuata</i>	100±	20°15'	155°55'
26	1720	<i>Stenella attenuata</i>	6	20°06'	155°55'
27	1230	<i>Stenella attenuata</i>	8	19°30'	155°58'
28	0715	Unident. porpoise	30±	18°57'	155°43'
28	0909	<i>Stenella attenuata</i>	2	19°00'	155°35'
28	1620	<i>Steno bredanensis</i>	3	19°39'	154°57'
29	1245	<i>Stenella longirostris</i>	30±	20°25'	155°44'
29	1502	Unident. porpoise	4	20°32'	156°02'
29	1555	<i>Pseudorca crassidens</i>	1	20°38'	156°06'
29	1645	<i>Stenella attenuata</i>	5	20°42'	156°00'
Mar.					
1	1040	<i>Tursiops truncatus</i>	5	20°59'	156°28'
1	1540	<i>Stenella attenuata</i>	10	21°13'	156°58'
2	0855	<i>Steno bredanensis</i>	3	21°15'	157°21'
2	1420	<i>Stenella attenuata</i>	6	21°44'	157°56'
2	1545	<i>Stenella attenuata</i>	4	21°38'	158°08'
3	0805	Unident. porpoise	1	21°36'	158°24'
4	0715	<i>Tursiops truncatus</i>	3	22°12'	159°31'
4	1107	<i>Stenella attenuata</i>	20	22°03'	160°06'
4	1155	Unident. whale	1	22°00'	160°13'
4	1610	<i>Stenella coeruleoalba</i>	5	21°39'	160°32'
6	1420	<i>Kogia breviceps</i>	4	21°30'	158°18'
6	1450	<i>Stenella attenuata</i>	1	21°28'	158°14'

coeruleoalba, and *Kogia breviceps* (Table 3).

DISCUSSION

The humpback whales of Hawaii are an important tourist attraction. They are regularly seen from cruise ships and interisland hydrofoils that ply these waters. This is one of the few places in the world where the general public has an opportunity to observe the great whales in their natural habitat.

A possibility exists that because the Hawaiian hydrofoil ferry lanes pass through certain areas of high whale concentration, collisions will occur that may result in whale deaths, vessel damage, and human injury. The vessels

were rerouted in 1975 during the time of year that the animals were in abundance to avoid the more densely concentrated areas. A number of researchers in Hawaii (Edward Shallenberger, pers. commun.) are working on the extent of the problem.

Meanwhile, the MMD plans to continue surveys of Hawaiian waters to improve existing knowledge of humpback whale distribution and abundance. Future plans include surveys in waters off Mexico and the Aleutian Islands east to Prince William Sound and southeastern Alaska. Work is now proceeding on a radio-tracking pilot study in southeastern Alaska with possible extensions to other areas as a

means of determining migrations to wintering grounds.

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The survey was discussed with William F. Takata, Hawaiian Division of Fish and Game, and Robert T. B. Iversen, Regional Representative, Southwest Regional Office, NMFS.

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