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The Former Dolphin Fishery at St Helena

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ABSTRACT

The spotted dolphin exploited at St Helena is of the same species as that exploited in the eastern tropical Pacific and referred to *Stenella attenuata*. Take is now illegal, but former catches were about 50–300 annually. A few bottlenose dolphins, *Tursiops truncatus*, were also taken. Impacts on the population are uncertain, because of poor documentation of catches and lack of good estimates of current population sizes. The fishery apparently originated in 'porpoise' harpooning by 19th-century whalers. The population of spotted dolphins is apparently isolated and offers a good opportunity for observation of what happens in a dolphin population when exploitation is halted.

INTRODUCTION

The existence of a dolphin fishery at the Island of St Helena (a Crown Colony of the UK) has been known for some time (Melliss, 1875; Fraser, 1966; Taylor, 1969; Finneran, 1979), but there has been very little information available on the identity of the animals taken or on the methods and scale of the fishery (Anon., 1980; 1981). The information reported here was gathered during a visit to St Helena during April–June 1983. The primary purpose of the visit was to determine the identity of spotted dolphins (*Stenella* sp.) reported from the island by Fraser (1966), as part of a taxonomic study of spotted dolphins of the Atlantic (Perrin and Perrin, in press). A secondary goal was to document the methods, catches, history, economic aspects and present status of the dolphin fishery.

METHODS

I observed and photographed dolphins on the lee side of the island from a chartered 28 ft (8.6 m) open fishing boat on 5, 11, 16, 26 May and 2 June.

The usual observation strategy was to make multiple passes through the moving school, photographing on the down-swell legs. On 5 and 26 May, I observed and photographed the animals underwater. On the latter underwater session the fishermen chummed with live bait (small mackerel), which held the dolphins within underwater viewing range for several minutes.

On 25 May, a 35 ft (10.8 m) sailboat was chartered to circle the island to observe cetaceans on the windward side, but the weather was rough and no cetaceans were seen.

To collect information on the dolphin fishery, which was officially halted in 1979 (Anon., 1981), interviews were tape-recorded with ten fishermen and one boat owner (Table 1) concerning its history, methods, catches and economics. Informal discussions were held with an additional 35–40 individuals, including government officials and employees of the St Helena Fisheries Corporation. I was interviewed by the island radio station and a notice was inserted in the island newspaper asking for information on the dolphin fishery.

Several days were spent examining books, official records and 19th-century newspaper files maintained in the island library and the Archives, but lack of time meant that I was able to examine only a fraction of the available material.

Table 1

Recorded interviews

	Occupation	Age	Started fishing	Status
1 *	Fisherman	75	1918–19	Retired
2	Fisherman	82	1914	Retired
3	Fisherman	>70	Before 1930	Retired
4 *	Fisherman	>70	1958–60	Retired
5 *	Fisherman	>70	Before 1930	Retired
6	Fisherman	>70	1920	Retired
7	Fisherman	68	~1925	Retired
8	Fisherman	62	-	Retired
9	Boat owner	>70	Before 1950	Active
10	Fisherman	43	1954	Active
11	Fisherman	>60	Before 1940	Inactive

* Sold dolphin heads to the British Museum.

THE DOLPHINS

Pantropical spotted dolphin, *Stenella* sp.

The taxonomy of the spotted dolphins is unsettled. It is likely that two species inhabit the Atlantic, an endemic species that has been referred in recent years to *S. plagiodon* and *S. frontalis* and a pantropical species that has been referred to *S. attenuata* and *S. frontalis*. While the species-level nomenclature has not yet been resolved (Perrin and Perrin, in press), the spotted dolphins at St Helena are of the pantropical type. I clearly observed the color-pattern characteristics that are diagnostic of the pantropical species (Perrin, 1975): white-tipped beak, cape well defined and passing high over the eye and with greatest depth at level of dorsal fin, narrow light band subsidiary to the cape, flipper stripe to gape and dorso-ventral division of the peduncle into upper dark and lower light areas. Calves are unspotted, and juveniles have pronounced dark spots below. Dorsal spotting in adults is so poorly developed as to appear absent when the animals are seen at a distance of only a few meters. In this they resemble the spotted dolphins that occur in Hawaiian waters (referred to *S. attenuata*—Perrin, 1975).

This was the dolphin most commonly harpooned in the fishery. The island fishermen call it 'bottlenose porpoise' or simply 'porpoise'. Skulls that were sold to the British Museum in the 1950s and 1960s (Fraser, 1966) came from the school of this species that frequents the northern side of the island.

The school that I observed consisted of several hundred dolphins. On each of the five days that I worked with it, it came into shallow water within 0.5 km of shore along the southern half of the northern, lee side of the island (Egg Island to Lemon Valley, Fig. 1) in the early morning and moved slowly north past Jamestown and went back offshore at the northern edge of the lee of the Island, off Sugar Loaf Point, before noon. During this slow passage, the school appeared to be loosely organized and dispersed over a distance of about 0.5 km in subgroups of about 5–10 animals. Groups of animals milled and made short forays offshore. There was a great deal of aerial activity, including high leaps (mostly by juveniles), forward flips, pitch-poling and tail lobbing. I observed occasional intense flurries of surface activity involving two or more animals and evidenced by violent, confused splashing.

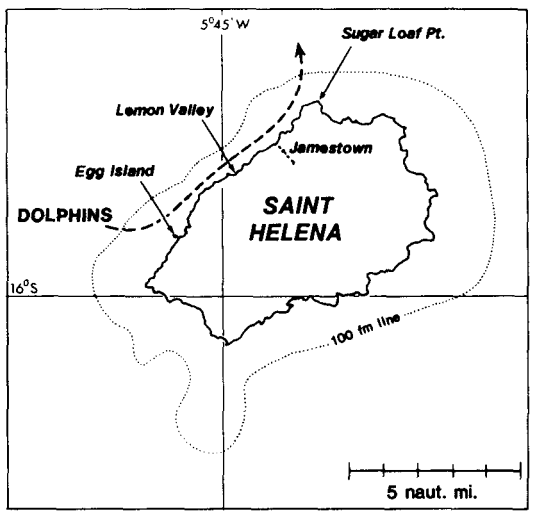

Fig. 1. Typical morning movement of the spotted dolphin school at St Helena in April–May, 1983.

Each time the school was approached, individual dolphins came to meet the boat and briefly rode the bow. They did not surface at the bow to breathe, but moved a few meters away from the boat, blew, and returned to the bow underwater. This differs from the typical bowriding behavior that I have seen in this species in other areas (e.g., Hawaii), in which the animals surface to breathe at the bow, and may be related to the fishermen's practice of harpooning dolphins from the bow.

On 11 May, I followed the dolphins to the edge of the Island's lee, off Sugar Loaf Point. Here part of the school spent several minutes 'surfing' in short steep swells coming from the northeast. It appeared that some of the dolphins made several passes in the waves, doubling back after traveling 100 m or so.

Several fishermen told me that once the school has gone offshore and out of the lee of the Island, it breaks up into several smaller schools that can be encountered up to several kilometers offshore in the afternoon. They are also occasionally seen on the windward side of the Island. Concerning seasonal variation in the daily pattern of movement of the school(s), they said that the dolphins are 'easiest to find' in April–May (the fishermen frequent the area year-round).

Bottlenose dolphin, *Tursiops truncatus*

This dolphin is called 'cowfish' or 'cow porpoise' but may be called 'angerine' by some fishermen (discussed below). It was taken in lesser numbers than the spotted dolphin. The collection at the British Museum (Natural History) contains 10 skulls from St Helena (Pilleri and Gihr, 1972).

I observed the bottlenose dolphin two (or possibly three) times. On 5 May, I saw several large dark dolphins with high falcate dorsal fins together with the school of spotted dolphins, off Lemon Valley. The fishermen said these were 'cowfish', but I did not get a good look at them. On 2 June, I photographed a small school (10–15) of bottlenose dolphins just inside Sugar Loaf Point at 0830 hours. Each time the dolphins were approached, they evaded the boat by diving for several minutes and coming up about 200 m away. On 5 June at 1420 hours, as I left the island aboard the R.M.S. *Centaur*, several bottlenose dolphins joined the ship about 5–7 km offshore, NE of the island, and rode the bow and the stern wake for about 10 minutes.

The fishermen told us that 'cowfish' sometimes frequent James Bay at night, feeding on flying fish that are attracted to lights on the waterfront.

Tursiops truncatus also occurs at Ascension Island, about 700 nmi northwest of St Helena. An officer on the R.M.S. *Centaur* (S. Bhatia) showed us a video-tape of several bottlenose dolphins riding the bow of the ship just off Ascension Island on 12 March, 1983.

Other Species

The only other species of small cetacean that can be said with certitude to occur (or have occurred) at or near St Helena is the spinner dolphin, *Stenella longirostris*, based on a skull in the Cleveland Museum of Natural History (No. 2413) labeled as collected at St Helena by the Blossom South Atlantic Expedition on 10 October, 1926. I showed photographs of spinner dolphins to several fishermen, but they did not recognize it, nor did they remember having seen its distinctive spinning behavior.

The fishermen reported occasional or seasonal occurrence of 'whale killers' (possibly killer whales, *Orcinus orca*); 'blackfish' (possibly short-finned pilot whales, *Globicephala macrorhynchus* and/or false killer whales, *Pseudorca crassidens*); 'whitebelly porpoise' (possibly common dolphins, *Delphinus delphis*, striped dolphins, *Stenella coeruleoalba*, or Fraser's dolphins, *Lagenodelphis hosei*); and 'black porpose' with blunt heads (possibly pygmy killer whales, *Feresa attenuata*, or melon-headed whales, *Peponocephala electra*).

While some fishermen may use 'angerine' (or 'angeline') when referring to the bottlenose dolphin, most use this name to refer to a quite different animal. The retired fisherman who I considered to be my most reliable and conservative informant described the 'angerine' as a little larger than a 'cow porpoise' (which he has measured as up to 2.5 m long), dark above and cream-colored below, with 4–5 white spots on each side and a short beak. He said that it occurs in groups of a dozen or so, never in the company of other dolphins. Others described the 'angerine' as larger than the 'cowfish' and with a few spots (pink or white and about an inch in diameter) and a white or pinkish belly. Murphy (1947) reported that the Yankee whalemen used the term 'algerine' (possibly derived from 'Algerian') for small beaked whales of the genus *Mesoplodon*, but the above description makes it very unlikely that this is also the usage at St Helena. The descriptions are most consistent

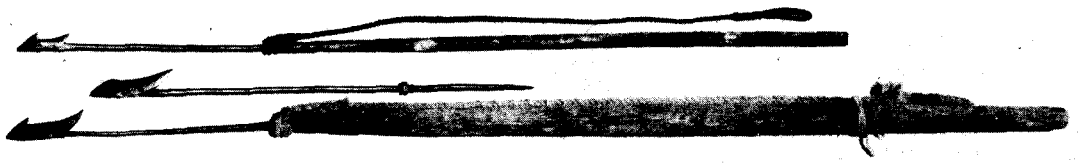

Fig. 2. Toggle-iron harpoons used for catching dolphins at St Helena into the 1960s. The top iron may have come from a Yankee sperm-whaling vessel; the bottom two were forged in Jamestown, St Helena.

with characteristics of the rough-toothed dolphin, *Steno bredanensis*; this, however, is a tentative conclusion. The 'angerine' was only rarely harpooned by the Islanders and is said to 'fight' harder than other 'porpoise'.

The inclusion by Melliss (1875) of the right whale dolphin (*Lissodelphis peronii*) in the fauna of St Helena seems questionable, as it is a cool-temperate species (Brownell, 1974) and the waters around St Helena are tropical, albeit seasonally verging on warm-temperate. It is possible that he included it on the basis of accounts by seagoers who saw the dolphins not near St Helena but while *en route* to or from the island.

METHODS AND EQUIPMENT OF THE FISHERY

In the memory of the fishermen, which extends in some cases back to shortly after the turn of the century, dolphins have been harpooned from small open fishing boats (6–12 m) that were operated out of Jamestown primarily to take tuna and other large pelagic fish. The number of these small boats has fluctuated between about 10 to about 20, with some engaged in fishing only part-time. In very recent years, island fishery operations have been upgraded (Harvey, 1980), with adoption of centralized marketing, addition of a cold-storage plant, and acquisition of two high-seas fishing vessels. Whereas formerly all fish caught were consumed locally, St Helena now exports fish (frozen and dried). The larger vessels, however, have not been significantly involved in the dolphin fishery.

Until after World War II, the fishing boats were all powered by sail. Light gasoline-powered outboard engines were tried in the late 1940s, but by the late 1960s most of the boats were equipped with small diesel engines, mounted amidships.

Most of the dolphin take was of animals harpooned at the bow while the boat was underway (called 'ironing'). Although this became easier when the boats converted from sail to engine, because the dolphins were more apt to ride the bow-waves of the faster-moving boats, it was always difficult, with fishermen sometimes hunting all day but missing on every throw.

Until the 1960s, the toggle-iron harpoon used was similar to that used for sperm whales in the 19th century (Fig. 2). Some whaling irons in use actually came from Yankee whalers, the last of which ceased whaling in the early 1920s. Others were forged on the island but patterned after sperm-whaling irons. The St Helena harpoon differed from the 19th century whaling harpoon only in having a shorter pole (about 1–1.2 m long). The locally-made irons differed chiefly in having a tang rather than a socket. Some fishermen recognized that the sperm-whaling iron was unnecessarily large for use on dolphins and commissioned scaled-down versions. Some of these were mounted on lengths of galvanized pipe rather than wooden poles. In the

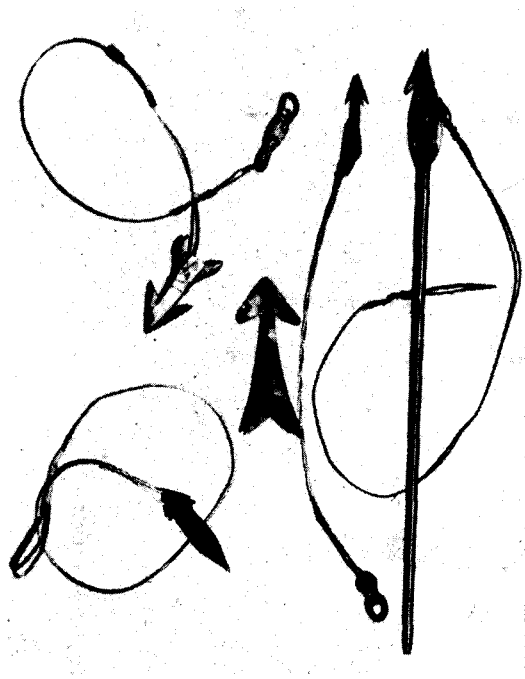

Fig. 3. Detachable harpoon heads used for dolphins, wahoo and yellowtail at St Helena since the 1960s. All were handmade.

1960s, visiting yachtsmen introduced a different type of harpoon, of the sort used widely for swordfish and other large fish. The line is fastened to a detachable head that separates from the rest of the harpoon when the quarry is struck (Fig. 3). The rod that carries the head is mounted on a 3 m bamboo pole. This harpoon is called by the fishermen a 'spear', as opposed to the older 'iron'. While taking of dolphins is now prohibited, the boats still carry harpoons, because they are also used for wahoo and yellowtail (*Seriola*).

The islanders also caught spotted dolphins while fishing for mackerel with monofilament handlines. When a dolphin seized a hooked mackerel, it was carefully eased ('dredged' in island terminology) close to the boat and then gaffed or harpooned. At times, several dolphins were taken in this manner by a single boat in one day. In some years the mackerel season has lasted several weeks or months, and in other years the mackerel have not appeared around the island at all. A few spotted dolphins were also taken in this manner on tuna handlines with live bait.

Although a few bottlenose dolphins were taken from boats, most were harpooned in the harbor at night during

seasonal appearance of flying fish (Exocoetidae). A flying fish was attached to a short line on a long bamboo pole and used as a lure to attract the dolphins close to the quay (usually at 'The Steps') or a moored boat, so that they could be harpooned. Usually not more than one per night was captured with this technique.

Some of the fishermen experimented with the use of firearms (in one case a large-bore shotgun loaded with birdshot) but found that a large proportion of the dolphins shot sank before they could be retrieved.

A very few dolphins are taken accidentally when they become entangled in mooring lines in Jamestown Bay.

CATCHES

The only previously published estimate of dolphin catches is 'some 20 . . . annually' (Anon., 1981). Records of dolphins sold to the St Helena Fisheries Corporation were only kept for 1978 (T. Richards, pers. comm.) when 37 dolphins were logged (some landed dolphins were not sold to the Corporation and therefore not logged).

The pursuit of dolphins has always been an adjunct to other fishing activities. Typically, a dolphin or two was caught on the way home from the tuna grounds after a day of low catch, although on occasion as many as 12 are reported to have been caught by one boat in a day (during the 'day-mackerel' season).

Table 2

Estimates of dolphin catches at St Helena, obtained in interviews with fishermen

Parameter	Estimates
Usual catch/boat/day	1, 1, 1–2, 2, 2, 2–3
Maximum catch/boat/day	3, 3, 3–4, 4, 5–6, 6, 6, 8–9, 9–10, 12
Usual catch/boat/year	14–15, 20, 20
Usual total catch/year	~50, 50–100, <100, ~100–200, ~150, ~200, >200, 200–300
Usual total catch at steps/year (*T. truncatus*)	"a few", 7–8, 15
Probable present catches/year	"a few", 5–10, ~6, 10
Number of boats in fleet	5–6, 7, 8, 8–10, ~14 *, 12–15 *

* Includes part-time boats.

The casual estimates of catch levels obtained by us from the fishermen in interviews were highly variable (Table 2), as were estimates of the number of boats fishing for dolphins (5–6 to 12–15). Some of the variation can be ascribed to the fact that several of the retired fishermen interviewed had fished for dolphins at various times over the last 20–60 years. As casual and variable as the estimates are, however, there is some internal consistency. The estimate of catch per boat per year (no. 3 in Table 2) was relatively stable, and when this (~15–20) is multiplied by the approximate size of the full-time fleet (no. 7, ~5–10 boats), a very rough catch estimate of 75–200 dolphins/yr is obtained, which is consistent with the range of estimates of total annual catch (~50 to 200–300). These were mostly spotted dolphins; the catch of bottlenose dolphins would appear to have been on the order of 5–15 per year.

Some of my sources stressed the seasonal and year-to-year variability of fishing success in the waters around St Helena. The seasonal nature of the mackerel fishery is discussed above. The availability of tuna is also highly variable, and when tuna catches were low, more time was spent pursuing dolphins. These factors account for the inconsistency of the estimates of daily catch rates (no. 1 in Table 2) with the estimates of annual catches; dolphins were sought only on some days, in some seasons, and more in some years than in others.

None of the informants thought that there had been a long-term trend in dolphin catches or availability. However, several noted that harpooning dolphins became easier when diesel engines were added to the boats in the 1950s and 1960s. They believed that there had perhaps been a peak in dolphin catches at about that time.

The dolphin fishery was officially terminated in 1979. A condition of the required fishing license issued by the Fisheries Corporation is that 'no porpoise . . . be taken'; violation carries a fine of up to £1000. A very few dolphins are still taken illegally, however (Table 2), for consumption by boat crews or for family use. No dolphin meat now appears in the market.

IMPACT OF THE FISHERY

Very little information is available on the sizes of the populations of dolphins around St Helena. The school of spotted dolphins that I saw, which I was told is the 'Island school', contained several hundred animals. The size of this school was estimated by five of my informants to be >1000, 1000 or more, 1000s, 100s and 500–1000. One said that he had once seen a school offshore (~2.5 mi) that contained 'many 1000s' of animals. Assuming that the population is isolated, to support a sustained annual take of 75–200 it would have to contain about 1,250–5,000 dolphins, and perhaps more (based on a maximum sustainable yield of 0–6%—see Smith, 1983). While more information on present population size and past removals is needed before an assessment of population status or fishery impact can be made, the present very low levels of take are unlikely to affect the population adversely.

We know even less about the population of bottlenose dolphins around St Helena. The school that I saw contained no more than a few 10s of animals, but there may be more schools around the island.

UTILISATION

Dolphin meat is well liked by the islanders; there would be a ready market for it if the taking of dolphins were not illegal. In the 1950s and 1960s, the retail price was 6d per 'piece' which varied in weight between about 1 and 2 lbs depending on demand. In more recent years, up to 1979, the price was 20–30p per piece, about the same as the price for tuna and higher than that for mackerel.

Nearly the entire animal was utilised. The head and intestines were discarded at sea or given away; everything else was sold, including lungs, kidneys, stomach, liver, gonads and other organs. The favored cuts came from the ribs and the neck. The meat was often cooked with the skin and blubber attached, usually in curries. Oil extracted from the head was used for oiling tools, fishing equipment, etc.; oil extracted from the lower jaw was used for oiling watches and other fine mechanisms.

ORIGINS OF THE FISHERY

Several lines of evidence point to the 19th-century Yankee sperm whale fishery as the origin of the St Helena dolphin fishery. As noted by Mellis (1875), Mitchell (1975) and many others, the sperm whalers took 'porpoise' (dolphins) for two reasons: to provide practice for the harpooners and to obtain fresh meat for the crew.

As early as 1805, St Helena was a major way station for Yankee whalers fishing the Indian and Pacific oceans (Brooke, 1808). In 1855, for example, at least 43 whalers, mostly US-registered, called at St Helena; at least 6 called twice (St Helena newspaper files). St Helenians served as crewmen on some of these whalers. At least three times between 1830 and 1875 (and once in this century—Lea, 1929) St Helena attempted to develop its own local industry to take the seasonally occurring humpback whales; all of these ventures came to naught (Taylor, 1969; Gosse, 1938). In any case, there was extensive exposure of St Helenian seagoing men to the Yankee practice of harpooning dolphins.

There were at least three sources of sperm-whaling gear for dolphins at St Helena: 1) St Helenians who had returned after shipping on whalers may have brought harpoons or the technology to make them, 2) auctions of the equipment of the failed St Helenian whaling operations, e.g. in 1856 (*St Helena Herald* of 16 October), and 3) sales of equipment of the many whaling vessels condemned at St Helena, e.g. in 1856 a list of items to be auctioned from the condemned barque *George* (Newport, Rhode Island) included 'masts, spars, sails, stanching and running rigging; also the whale boats, and all other whaling gear, viz-trypots, casks and shooks, hooping &c., harpoons, lances, whale lines, and various other articles' (*St Helena Herald* of 1 January, 1857).

Another piece of evidence pointing to a whaling origin of the dolphin fishery is the islanders' use of Yankee whaling terms such as 'bottlenose porpoise' (applied to small dolphins), 'blackfish', 'cowfish', 'angerine' and 'iron' (used both as a noun and a verb).

There is some evidence to suggest that a dolphin fishery did not exist at St Helena before the mid-19th century. I searched an early-19th-century military midden (at Rupert's Bay) extensively for animal remains and found abundant evidence of reliance on the sea for food: in addition to remains of domestic animals and fowl, the site contains large numbers of limpet shells (*Patella*), shells of other gastropods and bones of fish, including large tunas, but no cetacean remains.

The St Helena dolphin fishery, then, probably arose as an outgrowth of Yankee whaling sometime in the latter two-thirds of the last century.

RECOMMENDATIONS FOR FURTHER RESEARCH

The dolphins at St Helena offer a very good opportunity for studying the population dynamics of dolphins. Management of dolphin populations has been based on a theorized 'surplus' or net production under exploitation, caused by increased reproductive rates and/or decreased natural mortality rates (Smith, 1983). There is as yet no empirical evidence that such net production occurs in an exploited dolphin population. The spotted dolphins at St Helena were exploited for at least 65 years and probably longer. They are of the same species as tens of thousands of dolphin taken annually in the eastern tropical Pacific (IWC, 1983).

The present size and composition of the population could be estimated using several techniques; these include additional survey and observation effort from small boats, survey from the mast of a larger vessel, aerial photography from a tethered balloon or remote-controlled drone, survey and monitoring from a cliff-top station (sea cliffs at the portion of the coast line where the dolphins come close inshore are several hundred feet high) such as has been done in studying spinner dolphins (*Stenella longirostris*) in Hawaii (Norris and Dohl, 1980) and dusky dolphins (*Lagenorhynchus obscurus*) in Argentina (Würsig and Würsig, 1980), and underwater observation and photography to determine size, structure and dynamics of subgroups and to follow naturally-marked individuals through time.

Vessel-based survey effort is needed to determine the offshore extent of the range of the resident spotted-dolphin school and to investigate the possibility that there are dolphins offshore (within, say 30 km) that do not regularly come close to shore. Survey of the windward side of the island is also needed (during the rare calm weather there).

Excavation of the many 19th and 20th century middens on the island could yield information on the beginnings, geographical distribution (e.g., in the interior vs in Jamestown) and scale of consumption of dolphins. This, coupled with the results of further interviews and archival research (to determine, for example, the number of boats operating in different periods) may make possible estimation of removals over time, a necessary task if the present status of the population is to be assessed.

Should the above studies reveal that the fishery had a significant effect on the population, this would be an excellent opportunity to see what happens when exploitation of a dolphin population stops. Will it grow? Will production of calves decline? This opportunity for a case study of an isolated and accessible population with a long history of exploitation is unique and valuable.

NON-CONSUMPTIVE UTILISATION

The spotted dolphins at St Helena also have potential as a tourist attraction. They can be found nearly every day in the same place, very near Jamestown Harbor and in quiet clear water. Despite having been pursued in the past, they are approachable and could be expected to become quite tame under conditions of sustained benign interactions with humans. They could be observed below the surface by snorkeling or with a glass-bottomed boat. Marketing research would be needed to determine the practicability of such an operation.

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