A LIVE CAPTURE TECHNIQUE FOR THE KILLER WHALE *ORCINUS ORCA*[1]

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Introduction

Capture techniques for many species of smaller cetacea have been previously described (BROWN and NORRIS, 1956; GRAY, 1964; NEWMAN and McGREER, 1966; GRIFFIN and GOLDSBERRY, 1968; WOOD, 1973; NORRIS, 1974; ANONYMOUS, 1974; MITCHELL, 1975; ASPER, 1975; WALKER, 1975; BIGG and WOLMAN, 1975). One must keep in mind that these techniques are continually being changed and upgraded to provide maximum safety for the animals being collected as well as the collectors themselves.

Prior to the implementation of modern live capture techniques, several smaller cetaceans, including killer whales *(Orcinus orca)* were obtained unsuccessfully for research and/or public educational display using projectiles or hooks attached to retrieving lines (BROWN and NORRIS, 1956; NEWMAN and McGREER, 1966). Generally, these methods gave way to modern techniques in about the mid-1960's. With the advent of such modernizations as the breakaway hoop net technique, and shallow water seine net technique, success at cetacean live capture became commonplace.

While many of the smaller cetaceans (primarily pilot whales and dolphin) have been collected using the breakaway hoop net technique, at least one collector has utilized this procedure in the live capture of the killer whale (BROCATO, 1966 and 1975). Unfortunality, the collection was complicated by the aggressive behavior of a companion animal and the subsequent entanglement of the retrieving line in the collection vessel's propeller. For the obvious protection of the crew and vessel it was necessary to destroy the entangled animal. The aggressive companion animal was shot, but was observed swimming away from the area (BROCATO, 1966).[2]

[1]Sea World, Inc., Contribution No. 7604

[2]The authors have recovered several bullets from killer whales captured live for public display. In at least three cases the bullets were discovered in animals and removed several years after the live capture. The entry wounds from the bullets were, in most cases, not evident at the time of capture.

Recent improvements in the live capture fishery for the killer whale *(Orcinus orca)* are reflected by a zero mortality rate in the fishery since 1970 (ASPER and CORNELL, 1977). One of these significant improvements is the use of harmless and humane acoustic devices to herd and otherwise ensure that the animals do not wander into the unclosed portion of a set, thus precluding their possible entangelement in the billowing net ends. These include the use of the California seal control devices by the American live capture fishery and the use of diver recall acoustical devices by the Canadian live capture fishery. Both of these devices deliver approximately 85-90 decibels of very low frequency sound at one meter distance, less than 500 Hz. At ten meters the sound diminishes rapidly in intensity to less than 60 decibels. On an average, there is a 20 decibel decrease for each ten meters distance from the device (EVANS, 1976).

The killer whale generally has a high frequency hearing range, 500 Hz to 32 kHz, and sound production capabilities of 15-110 decibels at frequency ranges from as low as 1.5 kHz to a majority of peak energy at 10-30 kHz (HALL and JOHNSON, 1972). The acoustic devices are, therefore, below the animals' known useable capabilities of hearing and rather close to their production capabilities in both frequency and sound level. The whales tend to avoid these sounds, probably more as a result of being startled than anything else.

Ships and/or other vessel traffic in the killer whales' habitat waterways range from 60-110 decibels at ten meters (EVANS, 1976). Historically, the knowledge that surface or vessel produced noises aid in the herding of fish and cetaceans has been used by fishermen for hundreds of years. Various other tools, implements and techniques used by fishermen have included the dropping of rocks into the water, the pounding or slapping of oars or other objects on the surface of the water, the beating of pots and pans or pipes below or above the surface of the water, the exploding of dynamite and discharging of firearms into the water, the use of outboard motors and/or speed boats and acoustic control devices. Additionally, tape recordings played through underwater speakers have recently shown some success (VANIA, 1975).

Materials and methods

A rather significant improvement in live capture techniques was the design and structure of the shallow water seine net. The tensile strength of these nets is enough to adequately retain the animals, but will allow their breakthrough and escape in case of an entangelement.

A 12 inch (30.5 cm) stretch mesh seine net, 2500 feet (760 m) in length by 60 feet (18 m) in depth is utilized. Suitable lead weights are added to the entire length of the bottem line to ensure that the net descends rapidly and remains close to the contour of the floor of the waterway throughout the procedure. The addition of floats to the surface line ensures the top line will not sink below the surface.

The described net is set around a pod of killer whales in a preselected area with minimal tidal action. An aircraft can be helpful in spotting the animals and relaying their location. The set is made from a purse seiner as rapidly as possible. One or more high speed boats are used to aid in the set and to protect the open ends of the net until their closure. Acoustic devices, such as the California seal control, can be utilized to both herd the whales prior to the set, and to aid in keeping the animals within the confines of the net prior to and during the closure of the net, thus ensuring the whales stay safely clear of the billowing net ends.

Once the set has been completed (Fig. 1) the "corners" of the net may be anchored against tidal pressure or currents. The animals can be allowed time for acclimation to their enclosure if desired. Usually a few hours to a day or so is adequate. During the acclimation period, another

Fig. 1. Killer Whales safely enclosed in seine net. (Photograph - Sea World, Inc.)

Fig. 2. Corral or pen utilized for separation or removal of animals. (Photograph - Sea World, Inc.)

which may escape the original set.

A shorter, but similar, net is then utilized to begin a careful separation and removal of animals to a pen or "corral" made of the similar netting (Fig. 2). This pen can be any shape, but is usually square in structure, approximately 60 feet (18 m) by 60 feet (18 m) by 15 feet (4.5 m) deep. Three or four sides of its perimeter at the surface are made of floats suitable to support the weight of several men and any additional collecting and/or transport equipment. The pen is located within a corner of the original set, anchored, and the selected whale or whales herded into the pen using the separator net (Fig. 3). The net is again utilized to select and separate an individual from within the pen. The animal is then placed in a suitable stretcher (Fig. 4) to be hoisted aboard a boat or dock for further examination and evaluation.

This separation procedure can be used repeatedly, as needed, to examine all animals in the group, thus determining firsthand those individuals most suitable for the collectors' purposes. Animals not desirable for the collectors' purposes can be released directly from the stretcher to either the pen, the enclosure, or the wild. Some animals may be sufficiently evaluated and released or removed without prior handling.

The authors have successfully collected killer whales utilizing the techniques described herein. It should be noted, however, that any given collection procedure is subject to variation at the collectors' option to ensure the safety of both the collectors and the whales. These variations may be modifications of the described procedure or may be completely new techniques developed as a result of peculiar or unforeseen circumstances.

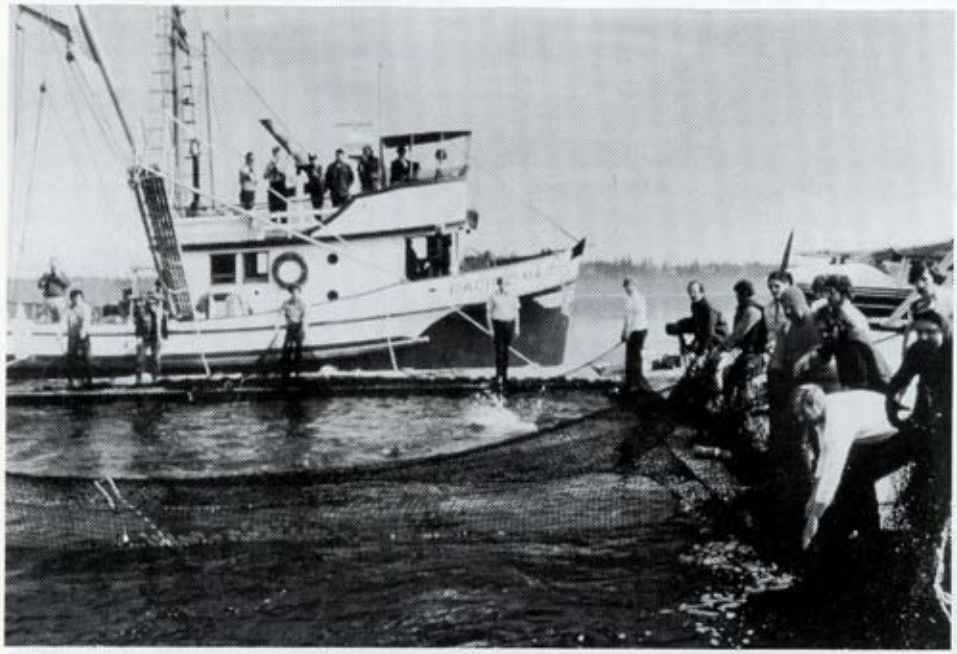

Fig. 3. Killer whales being separated or herded into the pen with the separator net. (Photograph - Sea World, Inc.)

Fig. 4. Killer whale in a suitable stretcher being hoisted aboard the boat for examination. (Photograph - Sea World, Inc.)

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