

Gear, Methods and Facilities Used in Several  
Bait Fisheries in the Pacific

By

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An adequate and steady supply of live bait is essential to the success of a pole-and-line fishery for tunas. The Japanese western Pacific and the American eastern Pacific tuna fisheries utilize the greatest amount of live bait. The live-bait, pole-and-line tuna fisheries in Hawaii, Ryukyu, Philippine, Palau, Papua New Guinea, Australia, and New Zealand and a few other areas utilize smaller quantities of live bait. This paper describes briefly the gear, methods, and facilities that are used in these Pacific areas.

Japanese Western Pacific Bait Fishery

The Japanese live-bait, pole-and-line fishery for skipjack tuna, Katsuwonus pelamis; yellowfin tuna, Thunnus albacares; and albacore, T. alalunga, now utilizes about 20,000 metric tons of anchovies as live bait annually. The anchovy, Engraulis japonica, constitutes about 97% of the live bait used. Previously, the sardine, Sardinops melanosticta, was the predominant species used. The use of the scad, Decapturus muroaji, and juveniles of the

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mackerel, Scomber japonicus, as live bait along with other species have been mentioned.

Most of the baitfish are caught with purse seine while others are caught with beach seines. There are two methods by which baitfish are caught with purse seines: (1) A fish finder vessel locates the baitfish aggregation around which the purse seiner sets the net. The baitfish is concentrated into the bunt and allowed to swim into bait receivers which are towed back to their mooring by a tug boat. (2) A light boat is used to attract baitfish before the purse seine is set and the same procedure as above taken. When employing a beach seine, a light boat is used to attract baitfish before the seine is set. The bait is again concentrated into the bunt and allowed to swim into receivers. In certain areas, the bait is first allowed to swim into bamboo cages after they are caught, which are towed back to their mooring and then the bait is allowed to swim into receivers for holding purposes.

The facilities needed to carry out this type of operation includes one- or two-boat purse seiners, a light boat, a fish finder vessel, numerous square, hexagonal or octagonal bait receivers, a tug boat, numerous bamboo transport cages, a good mooring area, and at times, bait transport vessels to obtain bait from other baiting areas when their local supply of bait is low.

American Eastern Pacific Bait Fishery

In recent years, the American eastern Pacific live-bait, pole-and-line fishery for skipjack and yellowfin tunas utilized about 250,000 scoops--907 metric tons, using 3.6 kg as a scoop--of live bait annually. Previous to the conversion of the tuna clippers to purse seiners, the fishery utilized as much as 4 million scoops--14,500 metric tons, using 3.6 kg as a scoop--of live bait annually. In recent years, the northern anchovy, E. mordax, made up the greatest percentage of the live-bait catch. The California sardine, S. caerulea, the anchoveta, Cetengraulis mysticetus, and the Galapagos sardine, S. sagax, are other baitfishes of importance. Up until 1961, the anchoveta was the most important baitfish in the eastern Pacific fishery.

Most of the baitfish in this fishery are caught with a lampara net. Some of the baitfish are caught with a beach seine. The lampara net is set after a school of baitfish is detected. The baitfish is concentrated into the bunt and is scooped with dipnets into the baitwells of the tuna clippers which go alongside the net. The beach seine is set after a baitfish school is seen and the bait is concentrated into the bunt. When it is too shallow for the clipper to approach the net, the bait is eased into a receiver which is towed out to the clipper.

The facilities needed for this baitfish operation are a powerboat, one or two skiffs and a bait receiver.

Hawaii Bait Fishery

The Hawaii live-bait, pole-and-line fishery for skipjack and yellowfin tunas utilizes about 35,000 buckets--127 metric tons using 3.6 kg as a bucket--of live bait annually. About 95% of the live bait used by the Hawaiian fishery is the anchovy, Stolephorus purpureus. The silverside, Pranesus insularum, and the round-herring, Spratelloides delicatulus, contribute a small amount.

Most of the baitfish is caught with beach seines with the remainder being caught by night lift nets. The beach seine is set after a school of baitfish is located. The bait is concentrated in the bunt and while the bait is thus held, the skiff slowly makes its way to the sampan with the bunt being spread by bamboo or wooden poles and a fisherman in the front of the bunt. When alongside the sampan, the bait is either bucketed into the baitwells or dipnetted into buckets and placed in the baitwells. At night, a light is set out from the sampan to attract baitfish. When an adequate amount of bait accumulates, the net is set by a skiff after which the lead line is hauled aboard the sampan and the bait concentrated in a pocket at the vessels' side. The bait is bucketed or dipnetted into buckets and placed in the baitwells. At times, the baitfish caught is transported for long distances. In this case the bait is either put into a bait skiff or a receiver and taken to the vessel. In either case the bait is dipnetted into buckets and placed in the baitwells of the sampans.

### Ryukyu Bait Fishery

The Ryukyu live-bait, pole-and-line fishery for skipjack and yellowfin tunas used about 270 metric tons of live bait annually in recent years. This fishery utilizes numerous species of baitfishes of which, the important ones are the cardinalfish, Archamia fucata; the bananafishes, Caesio tile and C. chrysozonus; the round herrings, Spratelloides japonicus, S. delicatulus, and S. atrofasciatus; the anchovy, Stolephorus pseudoheterolobus (now called S. heterolobus); and the juvenile of the bigeye scad, Trachurops crumenophthalmus.

A drive-in net and a night lift net are used to catch their baitfish. As the name suggests, in the case of the drive-in net, divers drive schools of baitfish into the net which is then raised to the surface. The baitfish is concentrated in the bunt and bucketed into the baitwells of a vessel. In baiting for cardinalfishes, several fishermen scout for them during the day and then lead the fishing vessel to the area where bait was seen. Only the bunt of the drive-in net is used to cover the haunt of the cardinalfishes after the baitfish has left and when the cardinalfish returned over their haunt before daybreak, divers lift the net to the surface. The night lift net utilizes four boats, one on each corner of the net and a light boat to attract baitfish. The net is lifted when adequate baitfish accumulated under the light. The bait is then concentrated in a pocket and put into bamboo baskets and held until taken by a fishing vessel.

The facilities used in this type of baiting operation included a bait boat, several skiffs or canoes and a number of bamboo baskets.

#### Palau Bait Fishery

Although there are no figures on the amount of baitfish utilized by the live-bait, pole-and-line fishery for skipjack and yellowfin tunas in Palau annually, it is believed that more than 100 metric tons are used annually. The anchovy, Stolephorus heterolobus, is the most abundant and important baitfish in Palau. The silverside, Allanetta woodwardi, the roundherring, Spratelloides delicatulus, the sardine, Herklotsichthys punctatus, and other species are used occasionally for bait.

The night lift net is almost exclusively used to capture their baitfish. Occasionally, a beach seine is used. A light is used to attract the baitfish and the net is raised when there is sufficient baitfish under the light. The bait is concentrated in a pocket and allowed to swim into receivers or is bucketed directly into the baitwells of the skipjack tuna vessels. It is assumed that bait fishermen are used whenever the baitfish is put into the receivers. The beach seine is set after a school of baitfish is seen. There is no information as to how this bait is transported to the vessels or if the bait is first placed in receivers.

Skiffs and floating receivers are facilities used in this fishery.

### Fiji Bait Fishery

Although a full scale live-bait, pole-and-line fishery for skipjack and yellowfin tunas is not yet in existence, the results of preliminary studies have shown baitfish catches of 5-7 metric tons by a research skipjack tuna fishing vessel.

Important night bait species found were the sardines, Sardinella sirm and Herklotsichthys punctatus; the silversides, Allanetta ovalaua and Pranesus pinguis; the mackerels, Rastrelliger kanagurta and Selar crumenophthalmus; the roundherrings, Spratelloides delicatulus and S. gracilis; the anchovies, Stolephorus buccaneeri and S. heterolobus, and a few other species. The most important day bait species found were the sardine, H. punctatus; the silverside, P. pinguis; and the anchovy, Thrissina baelama.

Several types of gear were used to catch the baitfish in Fiji. A beach seine was used to catch day bait and a night lift net and a stick-held dipnet or bo-uke ami was used to capture night bait. The beach seine was set around schools of baitfish found in the shallows which were transferred into a bait receiver which was towed to the fishing vessel and bucketed into the baitwells. With the night lift net and the bo-uke ami, a light was used to attract baitfish. The net was raised when enough baitfish accumulated under the light and the bait was concentrated into a pocket and bucketed into the baitwells of the fishing vessel.

The facilities used in this fishery was a bait skiff and a receiver.

Philippine Bait Fishery

Since the amount of baitfish used by the live-bait, pole-and-line fishery for skipjack and yellowfin tunas in the Philippines was returned in "cans"--no qualification of a can was made--it was estimated that the amount of baitfish utilized by this fishery should not exceed 100 metric tons judging from the amount of tuna landed in the Philippines. The sardines, Sardinella leiogaster, S. perforata, S. fimbriata, S. melanura, and the anchovy, Scutengraulis mystax, are the important baitfishes in this fishery.

The baitfishes are caught mostly with a night net called a sangab. Sometimes a lampara net called a chinchorro is also used to capture bait at night. The sangab is set against the current and eight or more dugout canoes with lights are placed at various intervals to attract baitfish. When baitfish are attracted under the lights, the canoes paddle over and into the sunken portion of the net and when sufficient bait is accumulated, two net canoes raise the lead line and concentrate the bait in a pocket. The bait is then led over a sunken portion of the nets with a light into a net tank. The bait is later transferred into a wire tank where it is held until picked-up by fishing vessels. With the chinchorro, a fishing vessel tows two sampans and a small motor boat to the baiting grounds. The motor boat uses a light to attract baitfish. When sufficient baitfish is attracted under the light, one of the sampans sets the net afterwhich the other sampan pulls up the lead line. The bait is then concentrated in a pocket and dipnetted into buckets and placed in the baitwells of the fishing vessel.

The facilities used in this fishery includes, sampans, several dugout canoes, a small motor boat, and several floating net and wire tanks.

#### Papua New Guinea

Although there are no figures on the amount of baitfish used by the live-bait, pole-and-line fishery for skipjack and yellowfin tunas in Papua New Guinea, it is conceivable that more than 500 metric tons of baitfish are utilized annually by the fishery based on the amount of tunas that are landed. Presently, the most important bait species in this area is the anchovy, Stolephorus devisi. Formerly, the bananafish, Gymnocaesio gymnopterus, was the most important baitfish. Numerous species of cardinalfish, sardine, silverside, roundherring, and others contribute to the bait catches.

The drive-in net and a stick-held dipnet are used to capture baitfish in this area. Schools of baitfish are driven into the drive-in nets by divers and then concentrated in a pocket and placed into baitwells of the fishing vessels. The bunt of the drive-in net is also believed to be used to catch cardinalfish as was done by the Ryukyuan fishermen. A light is used to attract baitfish when using the stick-held dipnet to catch night bait. After the bait was caught and concentrated in a pocket it is presumably bucketed into the baitwells of the vessels.

#### Australian and New Zealand Bait Fishery

Detailed descriptions of the operation of a bait fishery in Australia where they fish mostly for the southern bluefin tuna (Thunnus thynnus

maccoyii) are not available and only a few reports of surveys and live-bait, pole-and-line fishing trials for skipjack tuna in Australia and New Zealand are available. It was gathered from these reports, that the pilchard, Sardinops neopilchardus, the mackerel, Scomber japonicus, and the anchovy, Engraulis australis, were used as live bait.

Purse seines, lampara, night lift net and the bo-uke ami are gears used to catch baitfish in these areas. The baitfishes are located with echo sounders or concentrated with lights before the purse seine or lampara was set. The baitfish was then allowed to swim into the partially submerged holding pen. The bait was dipnetted from the holding pens into buckets and placed in the baitwells of the fishing vessels. A light was used to attract baitfish before the night lift net and bo-uke ami were raised and the same procedure as above was used to move the baitfish. The bait may also be transferred directly into the baitwells of fishing vessels by scooping them with dipnets.

Skiffs or motorboats and holding pens were facilities used in this fishery.