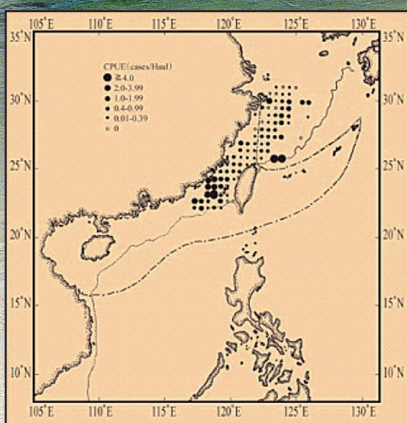


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台灣沿海「鎖管」資源 研析報告



● 鎖管類之漁獲分布圖
Distribution map on calamari catch

An assessment report on the calamari resources in Taiwan's near-coast waters

「鎖管」為海洋軟體動物，屬頭足類（魷魚、鎖管、烏賊、章魚、船蛸），身體分成為頭、胴體及足三部分，每年春夏為產卵期，棲息區域遼闊，遍佈於潮間帶至深海數千公尺都有。近期北部地區經常接獲漁民反映，大陸漁船越界捕撈「鎖管」嚴重，影響漁民權益甚鉅，「海岸巡防法」明訂「漁業巡護」及「漁業資源維護」為本署協助執行事項，悉以下列面向研析，據以瞭解台灣「鎖管」資源概況：

壹、「鎖管」生物習性及經濟價值：

一、生物習性

「鎖管」是台灣沿海穩定之漁業資源，台灣漁民以其特有之向光特性，漁船於黃昏時駛抵漁場，開啓兩舷集魚燈捕撈之，「鎖管」善於游泳、捕食魚蝦，大型魚類為其天敵，惟近年來自海上漁船之濫捕；海洋環境的惡化，已對該資源造成嚴重威脅。

The calamari is of a marine molluscas animal, and falls under the class of Acanthocephale (the squid, calamari, ink squid, octopus, ship mollusk), with its body in three parts of the head, body and tentacles. Every spring and summer being their spawning season, their habitat covers an expansive ground, ranging from the tidal zone to as deep as a few thousand meters in deep sea. Recently as many reports from the fishermen had been lodged in the northern area complaining of severe calamari fishing by trespassing mainland fishing boats, the incidents bear a detrimental effect to the fishermen's equity. And as the Coast Guard Act stipulates fishery escort and fishery resource maintenance being the administration's facilitative job, the following tendencies have been studied and analyzed in a move to discern the rough state of Taiwan's calamari resources:

Part 1 The calamari's biological characteristics and economic value:

I. Biological characteristics:

The calamari is of a stable fishery resource in Taiwan's near coast, where the Taiwanese fisherman arrive at the fishing site at dusk taking to the creature's drawing to light by opening the fish gathering lights on two boards of the boat. The calamari is good at swimming, preying on fish and shrimps, and large fish are their natural enemies; however over fishing by the fishing boats, and the deteriorating maritime environment have become serious threat to this resource.

二、經濟價值

「鎖管」在台灣漁業年產值中，佔有極為重要之角色，出港作業超過一天以上之漁船，會將所捕獲之「鎖管」急速冷凍保持鮮度，一斤在市場之行情為 60 至 70 元，出港作業未超過 12 小時的漁船，會將所捕獲之「鎖管」先用水煮或裝入水袋以碎冰冷藏，在市場行情每斤約為 90 至 100 元，每年均為台灣漁業帶來新台幣數億元之財富。

貳、「鎖管」種類、作業漁區（漁場）：

一、種類

全世界已知 7 屬 50 種以上，中國大陸產 2 屬 11 種，台灣產 2 屬約 8 種；8 種「鎖管」中，有 4 種產量多且體型較大（劍端鎖管、中國鎖管、筆管鎖管、軟翅鎖管），其他 4 種（田鄉鎖管、蘇門達臘鎖管、尖仔鎖管、大島鎖管）體型較小。

二、作業漁場

（一）「劍端鎖管」約佔台灣沿海管魷類總產量的 60% 至 72%，漁場主要分布於彭佳嶼西北至台灣北堆（澎湖北邊）；「中國鎖管」的漁場為台灣南堆（澎湖南邊）、澎湖西方海域，約佔總產量 20% 至 30%；「軟翅鎖管」廣泛分布於潮境區（台灣海峽）。

（二）依農委會水產試驗所 2000 至 2002 年之研究資料顯示，以台灣東北籍漁船（台北縣、基隆市）為例，捕撈鎖管之工具以燈火漁船為主，捕撈區域主要分佈於 200 公尺等深線以內之傳統漁場（彭佳嶼海域）大陸棚附近。

參、「鎖管」漁汛期及漁具漁法：

每年 4 月至 10 月是台灣「鎖管」之漁汛期，台灣專門捕「鎖管」之漁船，係使用棒受網，在漁船左右兩側點集漁燈，利用「鎖管」之向光性，誘使其集中於水面下，當「鎖管」集中一定程度時，關閉左側集漁燈，引「鎖管」至船的右側，隨後將起網機（於

II. Economic value

The calamari commands a vital role in Taiwan's annual fishery output. Fishing boats that left the port for more than one day tend to keep their calamari catch in deep freeze to preserve the freshness- the price of a kilo of calamari goes \$60 to \$70 in the market. Fishing boats that return in 12 hours tend to boil their calamari catch or place them in water bag for ice refrigeration, and the catch commands \$90 to \$100 a kilo. The industry brings to Taiwan's fishery industry with several hundred millions of wealth.

Part 2 The calamari's varieties and fishing grounds (fishing sites):

I. Variety

There are seven species and over 50 varieties known around the world, with two species and 11 varieties found in China, and two species and roughly eight varieties found in Taiwan. Among the eight varieties of calamari found in Taiwan, four of them are found in abundance and of a larger size (the sword calamari, Chinese calamari, pencil calamari and soft flap calamari), and the other four are smaller in size (the field calamari, Sumatra calamari, pin calamari and large island calamari).

II. Fishing grounds

(I) The sword calamari accounts for roughly 60% to 72% of total squid catch in Taiwan's near-coast area, with fishing sites largely distributed northwest to the Pong Jia Island up to Taiwan's Bei Duei (north of Penghu). The Chinese calamari's fishing sites are found in Taiwan's Nan Duei (south of Penghu) and waters of western Penghu, and accounts for approx. 20% to 30% of the total output. The soft flap calamari is widely distributed in the tidal zone areas (the Taiwan Strait).

(II) Research by Fisheries research Institute, Council of Agriculture between 2000 and 2002 showed in the case of fishing boats based in Taiwan's northeast (Taipei County, Keelung City) that calamari fishing tools mainly take to the lighted fishing boats, and the fishing areas largely distributed in the conventional fishing sites in the depth of 200m (the Pong Jia Island waters) and around the continental shelf.

Part 3 The calamari's fishing season, fishing gears and fishing method:

From April to October every year being Taiwan's calamari fishing season, Taiwanese fishing boats specializing in calamari fishing deploy the rod affixed fishing net by lighting up the fishing lights on two boards to lure the calamari to gather underwater. When the calamari groups to a certain degree, the left board of the fish gathering lights are turned off to draw the calamari to the right board. Thereafter, the net retrieval device situated at the stern is lowered into the sea, and the fish

船尾處)上之漁網放入海中,再將右側的集魚燈逐一關閉,將「鎖管」誘導至船右後方,當「鎖管」被引誘至漁網內時,即開動起網機收網。

肆、台灣地區作業漁船數量及產值：

(一) 作業漁船數量

依漁業署漁業年報統計,北部係以火誘網至彭佳嶼暨北部海域捕撈「鎖管」, (概有台北縣、基隆市等二縣市),台北縣舢舨以上船筏 547 艘,基隆市舢舨以上船筏 272 艘,至於有多少船筏實際從事該作業,並無實際統計資料(因火誘網亦會用來捕撈其他魚種)。

| | 88 (1999) | 89 (2000) | 90 (2001) | 91 (2002) | 92 (2003) | 93 (2004) |
|-----------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| 產量 (公噸) Industry output (ton) | 11,403 | 9,058 | 9,580 | 9,608 | 10,668 | 10,379 |
| 產值 (千元) Output value (\$1,000) | 1,659,368 | 929,563 | 834,264 | 919,935 | 786,407 | 2,060,222 |

(二) 產量及產值

台灣「鎖管」類燈火船漁獲量之多寡與氣候、海流、月齡、潮境、渦流之形成有密切關係,台灣地區沿近海「鎖管」的年產量約在 9,000 至 3 萬 2,000 公噸之間;依漁業年報統計,93 年度台灣「鎖管」產量總計為 1 萬 3,728 公噸,產值為 23 億 5 萬 1,364 元,主要產區在北部海域(彭佳嶼海域)及西南海域(澎湖海域),過去十年之產量及產值表如下:

伍、大陸地區漁船越界捕撈「鎖管」概況：

大陸漁船捕「鎖管」採集體行動,因捕撈「鎖管」係以「集魚燈」方式作業,船與船之距離必須保持一定,同一個區域不能有二艘作業船隻,為避免相互干擾,另一艘船則必須到更遠的地方尋找魚群,本國漁民大部分為單船作業,一旦漁區被越界捕魚之大陸漁船佔據,即必須另尋漁區,所以無形中增加了漁民捕魚成本,除此外,大陸鐵殼船

gathering lights on the right board are gradually turned off to lure the calamari to the rear right of the boat. As soon as the calamari is lured into the fishing net, the net retrieval device is activated to retrieve the fishing net.

Part 4 The number of fishing boats and industry output in Taiwan:

I. The number of operating fishing boats

According to statistics in the Fisheries Agency's fishery yearbook, of boats operating on light trap nets in the northern area of the Pong Jia Island and in the northern waters for calamari, there are 547 boats and rafts in Taipei County, and 272 boats and rafts in Keelung City, but there had not been statistics on the actual number of boats and rafts engaging in calamari fishing for trapping light also drawing other fish varieties.

II. Fishery output and value

The quantity of calamari catch by Taiwanese lighted fishing boats for trapping the calamari bears a close correlation to the climate, ocean current, moon cycle, tidal currents and vortex formation. The annual output of Taiwan's near-coast calamari catch is roughly at 9,000 to 32,000 tons; according to fishery yearbook statistics, in 2004 Taiwan's total calamari output is 13,728 tons, with an industry value at \$2,300,051,364, and the major fishing sites are in the northern waters (the Pong Jia Island waters) and southwest waters (the Ponghu waters). The table for industry output and value in the past ten years is as follows:

Part 5 The current state of illegal calamari fishing by trespassing mainland fishermen:

Mainland fishing boat's calamari fishing has taken to a group action. Yet in light that calamari fishing is bound by light trapping, a certain distance needs to be maintained between two boats, and no two boats can operate in the same area. In order to avoid interfering each other, the other boat needs to venture out farther in search of the fish colonies. The majority of the local fishermen tend to fish alone, and would be forced to look for other fishing ground if a fishing ground is occupied by mainland fishing boats, which intangibly adds to the fishing cost. Besides, the mainland fishing boats in a steel hull with bottom towing tend to sabotage the marine ecology and the growth of fish seedlings, causing the fishery catch to decline over years, and the

使用底拖網，對海洋生態、魚苗產生破壞，致漁獲量逐年減少，漁業資源枯竭後漁民生計將無著落。

陸、海巡署護漁作法與成效：

「鎖管」漁獲量驟減，大陸漁船越界捕魚係為其中因素之一，另訪查漁會及漁民對「鎖管」驟減原因尚有海豚太多（基隆區漁會理事長）、漁業資源的破壞及濫捕（萬里區漁會總幹事）、海洋生態改變（貢寮區漁會）、海水溫度過高均會影響「鎖管」之漁獲量，其中大陸漁船越界捕魚部分，本署多採驅離之方式，在基隆海巡隊、澳底海巡隊及北部地區機動海巡隊實施分區威力掃蕩下，93年越界大陸漁船已較92年明顯減少，比照「鎖管」產值、產量表，89年至92年有逐年下降趨勢，惟經海巡隊威力掃蕩後，已於93年呈現上揚態勢，顯見本署對「鎖管」之護漁成效。經統計92、93年以來，本署對越界之大陸漁船驅離成效如下表：

| | 92年度 (Year 2003) | 93年度 (Year 2004) |
|---|------------------|------------------|
| 驅離大陸漁船 Mainland fishing boats expelled (boats) | 745 艘 | 456 艘 |
| 越區帶案大陸漁船 Trespassing mainland fishing boats detained (boats) | 43 艘 | 15 艘 |
| 違反漁業法 Violation of Fisheries Act (boats) | 5 艘 | 9 艘 |

柒、彭佳嶼海域「鎖管」資源維護之具體做法：

近年來台灣沿海漁業資源日漸枯竭，本署基於機關職掌及海洋資源之永續經營，希能對各種漁業資源之保護，採取更積極主動措施，除依法驅離越界捕魚之大陸漁船外，茲以下列三項作法強化之：

一、建立雙向通報機制

每日由第一巡防區勤務指揮中心定時與「漁業電台」及轄區雷哨及守望通聯，對大陸越界船隻能做到先知快報，並由海巡隊採取立即之驅離措施。

depleted fishery resources would bear a detrimental impact to the livelihood of the local fishermen.

Part 6 Coast Guard Administration's fishery escort implementation and achievement:

Of the sharp decline in calamari catch, mainland fishing boats' trespassing for fishing is one of the reasons. In addition, interviews conducted with the fishermen's association and fishermen on the drastic decline of calamari catch also blames the excessive number of dolphins (the director general of the Keelung Fishermen's Association adds), fishery resource sabotage and rampant catching (the director general of the Wanli Fishermen's Association adds), changes of the oceanic ecology (the Gongliao Fishermen's Association says), and exceedingly high seawater temperature which hinder the fishery catch of calamari. Regarding to Mainland fishing boat's trespassing for fishing, the administration tends to take the expelling measures. With the dynamic regional divided crackdown movements by Keelung Maritime Patrol, Aoudi Maritime Patrol and Northern Mobile Maritime Patrol, the number of trespassing fishing boats in 2004 has obviously reduced than that in 2003, and by comparing the calamari's output and output value table, there is a declining tendency from 2000 to 2003. Nevertheless, through the Coast Guard's dynamic sweep, the figures have surged again in 2004, indicating the administration's fishery escort achievement on calamari. The statistics in 2003 and 2004, the administration's expelling achievements on trespassing mainland fishing boats are charted as below:

Part 7 Tangible implementation of calamari resource protection in the waters of Pong Jia Island:

In recent years, as the fishery resources in Taiwan's near-coast areas are gradually depleting, the administration, taking to its job specifications and in search of a sustainable management of marine resources, is anticipating to take more active voluntary measures for protecting various fishery resources, which entails not only to expel trespassing mainland fishing boats, but also intends to intensify measures with the following actions:

I. Constructing a two-way reporting mechanism

On a daily basis, Assignment Command Center of the first Guard Company is to routinely contact with the Fishery Radio Station, the radar posts and the watching posts, and notify the trespassing mainland fishing boats, whereby the Coast Guard flotillas conduct expelling measure promptly.

二、掌握漁船「作業漁區」資訊

本總局為先期掌握台灣周邊沿近海海域作業船隻狀況，已於「安檢資訊系統」增設「作業漁區」功能，將沿、近海漁民傳統作業漁場，區分30個漁區（沿海20個，近海10個）據以瞭解台灣周邊海域作業漁船動態，作為預劃海上護漁勤務之派遣依據，另藉由「作業漁區」資訊建立，針對可疑船舶異常動態研析，提昇查緝成效。

三、加速漁船定位系統之建置

目前遠洋船舶皆有裝設船舶定位系統，未來透過沿、近海漁船定位系統之建置，除在漁業權發生爭執時能確保漁民自身權利外，本總局將其與「作業漁區」之規劃相互結合，必能對漁船出海後實際之作業情形精確掌握。

捌、結論：

- 一、台灣周邊海域常因氣候、洋流、水文環境、食物來源等因素影響漁場區域及大小，本組為此曾與基隆水產試驗所進行研討，然仍僅能得知漁場概略位置，無法精確標定漁場位置。實務上必須發展進步之探魚技術，以獲取較多之漁獲量。
- 二、於沿、近海漁業資源資料庫之建構，涉及專業知識、科學儀器、人員訓練及長時間經驗累積等等，上述因素並非本署一機關之力所能完成，必須由相關主管機關主動投入，在其專業領域下，方可建置完成；本文意在起拋磚引玉之效，希喚起有關主管機關注意與重視，在「行政一體、資源共享」理念下，冀能共同戮力完成漁業資源資料庫，共享成果，一來有助於查緝成效之提昇，另一方面更有益於推動具體之保育工作。
- 三、署查緝機關與人蛇及走私集團鬥智過程中，應隨時處於上風，沿、近海漁業資源調查及統整分析之最終目的，乃希望結合「安檢資訊系統」達成下列三項執法利基：

II. Monitoring the information on the fishing boats' fishing sites

The Maritime Patrol Directorate General, in a move to monitor in advance the state of fishing boats operating in Taiwan's near-coast areas, has appended in its fishery inspection information system with a fishing site function, which divides the coastal, and near coast conventional fishing sites into 30 fishing zones (with 20 in coastal and 10 near-coast) with which to discern the status of fishing boats operating in Taiwan's adjacent waters, which would also serve as a basis for dispatching preplanned fishery escort duties. And through the input of fishing site information, it is now possible to conduct interactive assessment and analysis on suspicious ships in a move to excel the investigation and crackdown achievement.

III. Accelerating the launching of the fishing boat positioning system

Presently as most deep-sea fishing boats are fitted with vessel position system, in the future the launching of the coastal and near-coast fishing boat position system not only helps to ensure the fisherman's equity in the event of a dispute in fishing rights, but the Maritime Patrol Directorate General also intends to integrate the development of fishing sites to precisely monitor the fishery operation after their embarkation.

Part 8 Recapitulations:

- I. As the location and size of the fishing grounds in Taiwan's peripheral waters are often affected by factors such as the climate, ocean currents, hydrological environment, food source and such, the division has had explorative discussion with Keelung's Fisheries research Institute, but is only able to obtain the rough locations of the fishing sites yet unable to precisely mark down the location. In practical implementation, there is a need to further develop the fish exploring techniques in order to derive a great volume of fishery catch.
- II. With the mapping of coastal and near-coast fishery resource database that involves professional knowledge, scientific instruments, personnel training and long-time accumulation of experience and such that cannot be single-handedly completed by the administration, there is a necessity for the competent government authorities to join in the action in order to conclude the launching under whose professional domain. The purpose of this article aims to draw attention to the issue by presenting the facts and emphasis to relevant government authorities, in anticipation that a joint effort will be made to conclude launching the fishery resource database, as bound by the concept of one administration for resource sharing, which would allow all agencies to share the fruit, which is not only beneficial in excelling the investigation and crackdown achievement, but is also inductive in further promoting tangible conservation work.
- III. In the brain wrestle between administration crackdown agencies and the human trafficking rings and smuggling rings, it is imminent that the administration needs to gain an upper hand. The ultimate goal in coastal and near-coast fishery resource study and overall analysis rests is to achieve the three law enforcement niches by combining the fishery inspection information system.

(一)「觀察漁具、推斷該船至作業漁區之合理性」：

經由安檢資訊系統內建之漁業資源資料庫，將其與漁船攜帶之漁具相互比對、分析，用以研判漁船攜行之漁具是否為從事水上採捕或養殖時應備之工具，如發現可疑即可循勤務指揮系統，通報「巡防區」，由其調派海上服勤船、艇，備妥偵蒐器材嚴密監控，必要時予以蒐證。

(二)「提供巡防區預劃海上勤務」：

「巡防區」可透過沿、近海漁業資源資料庫，配合台灣周邊漁場之漁汛期，先期預劃重點海域之勤務，除了可以精減陸上人力外，一旦發現走私、偷渡情事，即可立即執行海上攔截、緝捕工作，減少上岸後緝捕之困難。

(三)「提供有關海洋保育參數」：

近年來各地方政府為了發展觀光產業，皆舉辦種海上活動（如飛魚祭），對保育類魚種（如鯨、鯊、豚）及資源枯竭魚種（如飛魚、魩仔魚）之魚體及魚卵均有超額捕撈情形，本總局負有協助主管機關執行海洋環境保護及海洋資源保育工作，可提供各作業漁區之漁船數據，以利主管機關或地方政府推動具體之保育工作（如減船措施、休漁計劃等）。

參考資料：

鎖管類之漁獲分布圖摘自漁業推廣第 200 期
魚類圖片摘自漁業署網站

(本文作者任職於海岸巡防總局檢管組)

(I) With observation of the fishing gears to deduce the rational of a fishing boat's operation in a certain fishing site:

The fishery resource database instilled at the fishery inspection post can be utilized for comparing and analyzing whether the carried fishing gears meet the required tools for fishing or aquaculture. Of any suspicion, the inspection post should notify, through the assignment operation system, the Guard Company to dispatch on-duty vessels to gather evidences when deemed necessary.

(II) To preplan duties for the Guard Company:

The Guard Company may preplan maritime duties at focused waters trough the coastal and near-coast fishery resource database, coordinated with fishery information on Taiwan's peripheral waters that not only helps to downsize the manpower on land but can effectively move to execute interception, crackdown and arrest jobs in the event of smuggling or human trafficking to reduce the difficulty of crackdown and arrest on dry land.

(III) To provide relevant maritime conservation parameters:

With local governments moving to stage a variety of maritime activities, such as the flyfish festival in search of tapping into the tourism industry, in terms of preserving the fish varieties (such as the whales, sharks, dolphins) and fish varieties in exhausted resources (such as the flyfish and whitefish), and excessive trapping of fish and fish roes, the Maritime Patrol Directorate General is responsible for facilitating the competent government agencies in carrying out marine environment protection, maritime resource conservation work by offering the boat count at a variety of fishing sites, which would facilitate competent government agencies or local governments in promoting tangible conservation works, such as fishing boat reduction, fishery rotation plan and so forth.

References:

1. The distribution map of calamari catch, excerpted from Fishery Promotion periodical, 200th issue
2. Fish drawings excerpted from Fisheries Agency Web site.
(The author is currently with the inspection & control division of Maritime Patrol Directorate General)



● 軟翅仔：又名軟絲仔、萊氏擬烏賊
The floppy flap: also known as the soft squid, Lyle's squid



● 透抽：又名真鎖管、劍尖槍烏賊
The translucent squid: also known as calamari, sword squid



● 台灣鎖管：又名中國槍烏賊
Formosa calamari: also known as the Chinese squid