

ANNUAL MEETING - JUNE 1967Designation of the hakes, (Urophycis chuss and Urophycis tenuis) in  
ICNAF statistics

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The specific status of the hakes, Urophycis chuss and U. tenuis has been a subject for debate during the last several years, particularly among Canadian workers (Leim and Scott, 1966). The confusion that has surrounded these two species quite naturally has been reflected in the ICNAF landing statistics (McCracken 1966). For example, in 1964 (ICNAF Statistical Bulletin Vol. 14 for 1964) the USA, USSR, and Canada (Newfoundland) reported catches of Urophycis by species while Canada (Mainland), France (St. P.), Germany and the U.K. preferred to report their catches simply as Urophycis (not specified). In the ICNAF statistics for 1965 (ICNAF Stat. Bull. Vol. 15 for the year 1965) the USA is the only country that reported landings for both species of hake. Canada (Newfoundland) and Spain reported their entire catch of Urophycis as "white hake" (U. tenuis) while Canada (Mainland) and the USSR reported only "red hake" (U. chuss) in their catch statistics.

There can be no doubt as to the validity of the existence of both Urophycis chuss or Urophycis tenuis. Biologically the two species are quite different. For instance, U. chuss normally grows to a maximum of 55 cm in total length and attains a weight of perhaps 2 kg. while U. tenuis grows to lengths in excess of 125 cm and may weigh more than 22 kg. U. chuss matures when at a total length of 28 to 30 cm. U. tenuis does not mature till it is more than about 55 cm in total length.

The early life histories of the two species also differs remarkably. U. chuss migrates to the bottom and abandons its post larval existence in the plankton when about 30 mm long. U. tenuis on the other hand, remains at the surface till it attains a

length of about 80 mm. (Descent may occur at a smaller size in shallow inshore areas). U. chuss instinctively enters the mantle cavity of the sea scallop Placopecten magellanicus where it lives inquilinistically until it literally grows too large to enter the host animal (110-140 mm total length). U. tenuis does not establish such a relationship with Placopecten or any other animal.

U. chuss is basically a temperate animal and finds its center of distribution off southern New England in the mid-Atlantic bight. U. tenuis is basically boreal and is most abundant in the Gulf of St. Lawrence and on the Grand Banks.

The general appearance is distinctive. Workers who have handled these two species of Urophycis can generally tell them apart simply by sight. Hence most New England fishermen can identify which species of hake they have taken. In general U. chuss is a dark reddish brown in color with white or yellowish undersides. U. tenuis is lighter being grey with purplish metallic overtones when fresh. It is also white on the underparts. U. chuss has a long filament on the first dorsal fin (the filament is more than two times the height of the fin). U. tenuis has a short filament on the first dorsal fin (the filament is less than two times the height of the fin). This character is a good one and is foolproof with the exception of specimens of U. chuss which may have broken fin filaments.

U. chuss always has three gill rakers on the upper bar of the first gill arch while U. tenuis always has two.

The character that has led to most of the confusion concerning the status of Urophycis chuss and U. tenuis in the past is the number of rows of scales along the lateral line. The literature for years has said that U. chuss has about 110 lateral line scales and U. tenuis has 140. Leim and Scott (ibid) have pointed out as has McCracken (ibid) that many hake are taken in Canadian waters with scale counts intermediate between those given for the two species. In actuality, when the situation is assessed, it is found that U. chuss may have from 98 to 117 lateral line scales (with a mean around 110) and that U. tenuis may have from 119 to 148 lateral line scales (with a mean around 130).

### System for Urophycis

Examination of several thousand fish at Souris, P. E. I. during August of 1966 revealed the hake catch to be made up of only one species - Urophycis tenuis. Souris is the major port for Canadian (mainland) hake landings from ICNAF area 4T. In New England waters this species, when mature, is found primarily in cold deep water, 80 fathoms (146 m) and greater or in areas where the water may be shallow but cool (such as at the mouth of the Bay of Fundy). On the other hand, U. chuss undergoes major seasonal migrations which seem primarily to be controlled by temperature. In the summer months U. chuss is found spawning over the continental shelf in water as shallow as 10-30 fathoms (18-55 m) off southern New England and as shallow as 3-4 fathoms (5-7 m) in the cooler Gulf of Maine. If U. chuss occurs in the Gulf of St. Lawrence at all it probably does so in very limited numbers because of adverse hydrographic conditions and most certainly does not contribute to the commercial landings from there to any measurable extent. The same may be said of the occurrence of this species on the Grand Banks. Templeman (personal communication) reports that he knows of no valid record of U. chuss from the Grand Banks and as he has pointed out (1966) all hake landed from Subarea 3 have been U. tenuis.

McCracken (1966) has suggested "(a) that the landings categories white hake, red hake, and hake (unspecified) become hake (common); and (b) that the scientific name designation become Urophycis sp." This suggestion when offered was a valid one because, as McCracken pointed out, by treating the two species as one no particularly pertinent information would be lost "since species designation in any case may be erroneous."

Our research has made it clear that the two species, chuss and tenuis, are valid and easily identified in most instances. There were inadequacies in the literature that lead to confusion - a case in point being the scale counts. These problems have been resolved.

We suggest that ICNAF consider the following protocol for maintaining separate statistics:

1. For statistical purposes any hake (Urophycis) taken in areas 1, 2, or 3 and subareas 4S, 4R, 4T, 4Vn, and 4Vs should be designated as white hake (Urophycis tenuis).

2. In subareas 4W, 4X and area 5, hake designation is not as simple as it is for the remainder of the convention area. U. chuss begins to appear on the Scotian shelf in small numbers in the area of the Sable Island Bank (ICNAF Subarea 4W), but U. tenuis continues to be the more abundant of the two species. To the south and west, U. chuss becomes increasingly abundant until in the most southwestern of the convention subareas (5Z) it is far more abundant than U. tenuis. The hake in these areas may be separated as follows:

Method of capture: Any hake taken by hook and line (long line, hand line, troll line, and trawl line) should be designated as white hake (U. tenuis). U. chuss is a much smaller fish and is seldom amenable to capture by commercial hook and line methods.

Size: As pointed out previously there is a substantial difference between the sizes attained by the two species. Any specimen of Urophycis larger than 55 cm standard length should be designated as white hake (Urophycis tenuis). (The relative numbers of U. chuss which attain or surpass 55 cm in total length are so few that the "contamination" in the catch statistics from that source would be insignificant.)

In Subarea 5 it is virtually impossible to make a significant catch of white hake with individuals averaging less than 45 cm. Any such catch may be arbitrarily designated as red hake (chuss). All shoal water (less than 60 meters) catches from April to November in Subarea 5 may be classified as red hake. During the late winter red hake aggregate and are taken in quantity in depths of 80 to 150 meters along the arc from Georges Bank to off Delaware. These catches may contain a few tenuis but they may also be quite safely listed as chuss, unless, as mentioned above, the average size is significantly greater than 45 cm.

In 4W and 4X, and within the Gulf of Maine in deeper waters, there will continue to be a problem if individuals do not learn to recognize the two species. Sufficient criteria for recognition have been included earlier in the present paper.

#### REFERENCES

- Leim, A. H. and W. B. Scott, 1966. Fishes of the Atlantic Coast of Canada. Fisheries Res. Bd. of Canada, Bull. 155.
- McCracken, F. D., 1966. Designation of hake (Urophycis) in ICNAF statistics. ICNAF Res. Doc. 66-55, Serial No. 1657.
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