

## **Appendix 7**

### *Background, Stock Status, and Management Issues of Seamount Groundfish (Armorhead) Fishery*

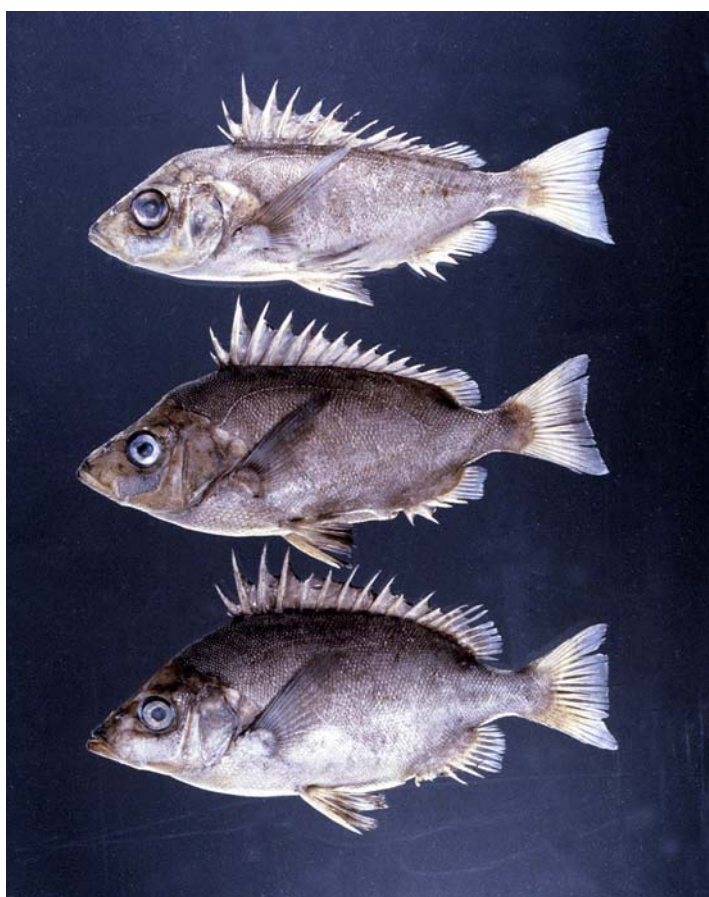
#### **Background - Armorhead Life History**

Armorhead undergo an initial 2+ year pre-recruit pelagic phase in surface waters of the temperate and subarctic North Pacific. During this pelagic phase, armorhead undergo somatic growth but remain non-reproductive. Armorhead return to the southern Emperor-northern Hawaiian Ridge (SE-NHR) seamounts (consisting of Koko, Yuryaku, North and South Kammu, Colahan, and C-H Seamounts outside the U.S. EEZ and Northwest and Southeast Hancock Seamounts inside the U.S. EEZ) and recruit to the summits and upper slopes of these seamounts. Recruitment to the bottom trawl fishery and to the seamounts are synonymous; these full-size adults recruit to the seamounts primarily during late spring-early summer. After recruitment, armorhead cease somatic growth, develop reproductively, and spawn annually at the seamounts during November-February. Post-recruit movement of armorhead between seamounts is considered unlikely. Population genetics studies indicate that armorhead consists of a single seamount-wide population.

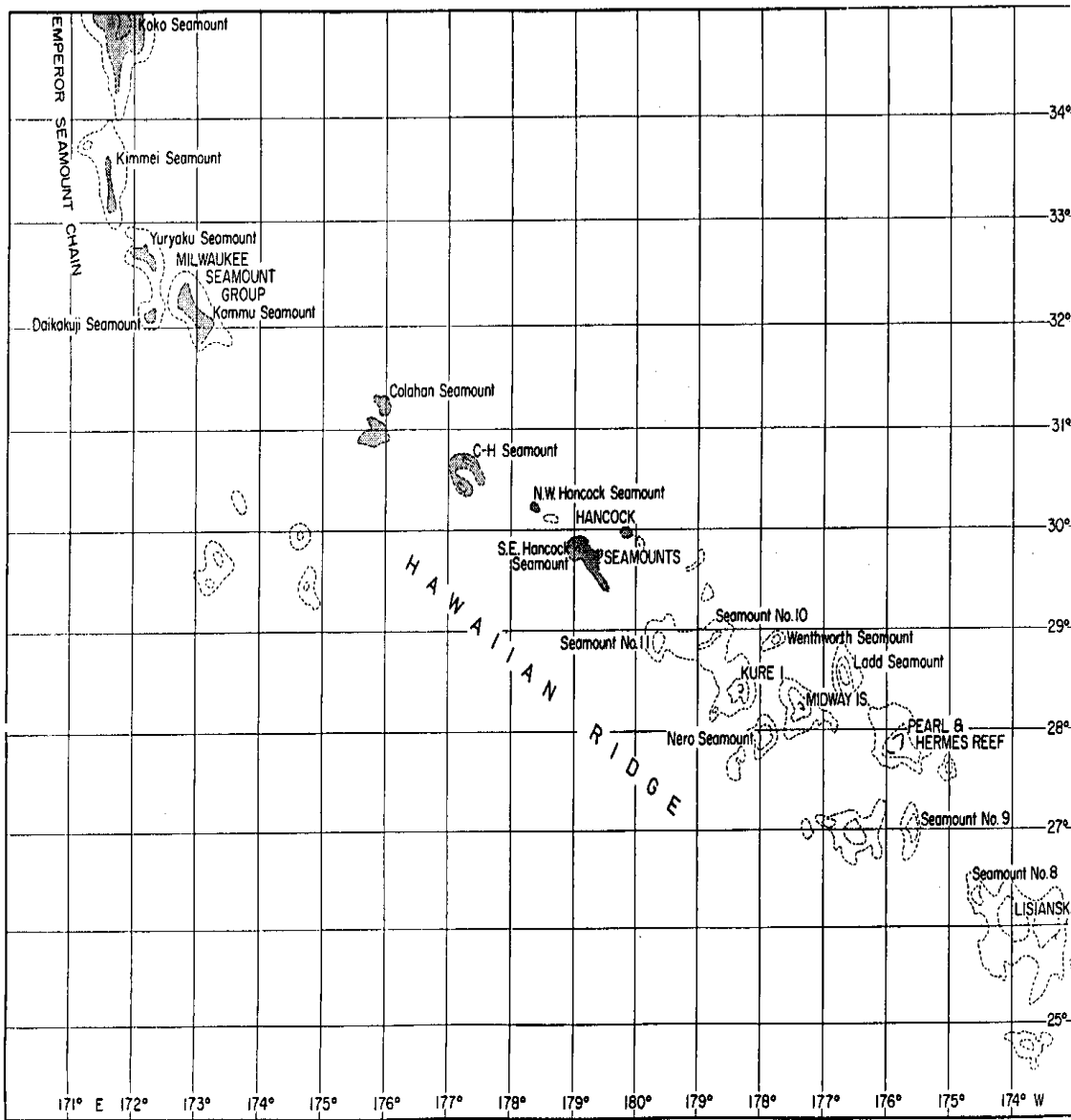
Armorhead may survive up to 4-5 years at the seamounts, however, individuals gradually become emaciated; undergoing an irreversible decline in somatic weight and body depth with age. Annual increases in armorhead biomass at these seamounts is therefore solely dependent on new recruitment.

#### **Background - Seamount Trawl Fishery**

Historical Fishery, 1968-1976



The seamount bottom trawl fishery for armorhead was initiated by trawlers of the former Soviet Union in November 1967; the Japan trawl fleet entered this fishery in 1969. This fishery initially focused on the northern large tablemount seamounts (Koko, Yuryaku, N. Kammu, and S. Kammu) of the southern Emperor Seamount chain. The fishery soon expanded southward to encompass the much smaller northern Hawaiian Ridge guyot type seamounts including Colahan, C-H, and the Hancock Seamounts. By the end of 1975, the combined catches of the former Soviet and Japan trawl fleet had reached some 1 million mt of armorhead harvested from the SE-NHR seamounts. The majority of this catch was harvested from the Milwaukee Seamount Group (Yuryaku and Kammu Seamounts). However, with the steady decline in trawl CPUE after the 1972 peak, the former Soviet Union fleet left the fishery after 1975 (see Fig. 1a). The



Japan trawl fleet continues to harvest armorhead on the seamounts outside the U.S. EEZ. Current and historic catch and effort data has relied on the commercial data of the Japan trawl fleet; useful data from the former Soviet trawl fleet remains unavailable. From the inception of this fishery to the present, the U.S. has never been a participant in the seamount trawl fishery for armorhead.

### Hancock Seamounts, 1977-2002

The inclusion in 1977 of the southernmost seamounts of the SE-NHR (i.e., Northwest and Southeast Hancock Seamounts) into the U.S. EEZ allowed for a small portion (> 5%) of the historic fishing grounds to be managed in a limited way. A Preliminary Management Plan was developed that year which provided for limited foreign harvesting at the Hancock Seamounts under a permit system during 1978-1984. Japan trawlers were the only vessels to apply for such permits and were subject to a combined annual harvest quota of 1,000 mt and required to carry a U.S. fishery observer aboard each permitted vessel. By the end of 1984, armorhead trawl catches remained low with harvest quotas never attained in any of the years during 1978-1984. Subsequently, under the bottomfish and seamount groundfish FMP, a 6-year fishing moratorium was imposed on the Hancock Seamounts in 1986. Beginning in 1985, the National Marine Fisheries Service Honolulu Laboratory began a series of stock assessment cruises to the Hancock Seamounts to monitor and assess armorhead abundance. These research cruises focused on Southeast (SE) Hancock Seamount and were conducted using bottom longline gear as opposed to trawl operations. This was necessary due to our limited trawl capabilities and the advantage that bottom longline gear offered in extending the sampling over irregular terrain that allowed the entire population to be sampled. The last assessment cruise was conducted in 1993; a total of 12 assessment cruises were conducted.

SPR values for the Hancock Seamounts (1985-1993) were computed as the estimated biomass on SE Hancock Seamount divided by the average biomass estimated for the first three years of the fishery (1970-1972). SPR values for seamounts outside the U.S. EEZ were based on Japan trawl CPUE as a proxy for SPR and were computed as the current year CPUE divided by the average CPUE during 1970-1972. Although new NSG rules have replaced SPR with MFMT and MSST, these new threshold measures will still need to be based on some proxy of the Japan trawl CPUE data. Prior to 1992, although population abundance showed some annual variation, the seamount population at SE Hancock Seamount (and also outside the U.S. EEZ) showed little evidence of recovery (see Fig. 2). This lack of recovery prompted two additional 6-year extensions of the fishing moratorium at the Hancock Seamounts; this last extension is due to expire on August 31, 2004.

### **Stock Status**

Since the seamount-wide crash of the armorhead trawl fishery in 1975, CPUE values have remained depressed and typically far below the 20% SPR overfishing threshold both at the Hancocks and outside the U.S. EEZ (see Figs. 1a-b, 2). Although in 1992 a dramatic increase in armorhead CPUE and %SPR occurred at seamounts outside the U.S. EEZ, these values declined

to very low levels by 1994 and remained depressed through 2002 (see Figs. 1a-b, 2). This 1992 event further indicates that any large seamount-wide recruitment peak are likely to be episodic and can originate even at low stock levels (the 1989 parental stock had the lowest SPR values both inside (1.0%) and outside (0.3%) the U.S. EEZ). However, this stock increase was effectively reduced, apparently by increased fishing pressure outside the U.S. EEZ, to the previous low level in a matter of 2 years. The Japan trawl fleet continues to trawl the SE-NHR seamounts outside the U.S. EEZ as these trawlers pass through this area on their way to and from other trawl fisheries in the Pacific. Besides Japan, other Asian nations appear to be fishing the SE-NHR seamounts outside the U.S. EEZ although information on this remains anecdotal.

With the cessation of NMFS stock assessment cruises to SE Hancock Seamount after 1993, SPR values for Colahan Seamount (Japan trawl CPUE used as proxy for SPR) were used as an indicator of armorhead stock conditions at the Hancock Seamounts. There were several reasons for the choice of Colahan Seamount. First, Colahan and the Hancock Seamounts are both guyots having much smaller summit areas (about 1.4 sq. nm) and shallower summit depths (141-150 fm) than the larger and deeper tablemounts of Koko Seamount and the Milwaukee Seamount Group. Fishing effort by the Japan trawl fleet has also been applied differently to these two types of seamounts. Fishing effort at Colahan and historically at the Hancock Seamounts was applied in short pulses of effort since catch levels could not be sustained for more than several days without a “cooling off” period. Conversely, at Koko and Milwaukee Seamounts, fishing was typically intensive over a sustained period of time. Furthermore, a close historical coincidence exists between Colahan and the Hancock Seamounts in annual CPUE of the Japan trawl fleet (see Fig. 1b).

All of our biological and fishery data suggest that any recovery of depressed conditions at the Hancock Seamounts will not occur in isolation from the rest of the seamounts outside the U.S. EEZ and that SPR values (based on annual CPUE statistics) for Colahan Seamount provides the best indicator of current armorhead stock conditions at the Hancock Seamounts.

## **Management Issues**

### Background

As was stated in the Federal Register (June 29, 1998), the range of the armorhead stock extends beyond the U.S. EEZ and therefore the moratorium action alone will not ensure a rebuilding of the stock inside the U.S. EEZ; however, they nonetheless considered that affirmative action in the EEZ was appropriate. The fishing moratorium at the Hancock Seamounts remains the only management attempt thusfar to enhance the depressed stock levels of armorhead throughout the SE-NHR seamounts and if anything may prove helpful as a “good faith attempt” by our government in any future management discussions with Japan and other participating nations.

The current 6-year fishing moratorium at the Hancock Seamounts is due to expire on August 31, 2004. Based on the low annual SPR values (> 0.5%) since 1998, both at Colahan

Seamount and at all seamounts collectively outside the U.S. EEZ, it is inferred that the status of the Hancock Seamounts armorhead stock is similarly depressed and under the 20% SPR overfished level.

### Options

Given the status ongoing overfished status of the armorhead stock, continued protection of the resource within the U.S. EEZ is likely warranted. Three options are presented here for consideration by the Council and its Scientific and Statistical Committee.

- Option 1: Permanently fishing closure for armorhead at Hancock Seamounts.
- Option 2: Re-implement a 6-year fishing moratorium for armorhead at the Hancock Seamounts
- Option 3: No action.

Establishing a permanent closure will ease the administrative burden of having to re-implement temporary moratoriums every six years. The 6-year moratorium, however, does required the Council and NMFS to revisit the status of the armorhead stock and evaluate appropriateness of continuing the management regime. The No-action alternative will result in the removal of all prohibitions and leave the fishery open to domestic harvest, for which there has never been.

# ARMORHEAD

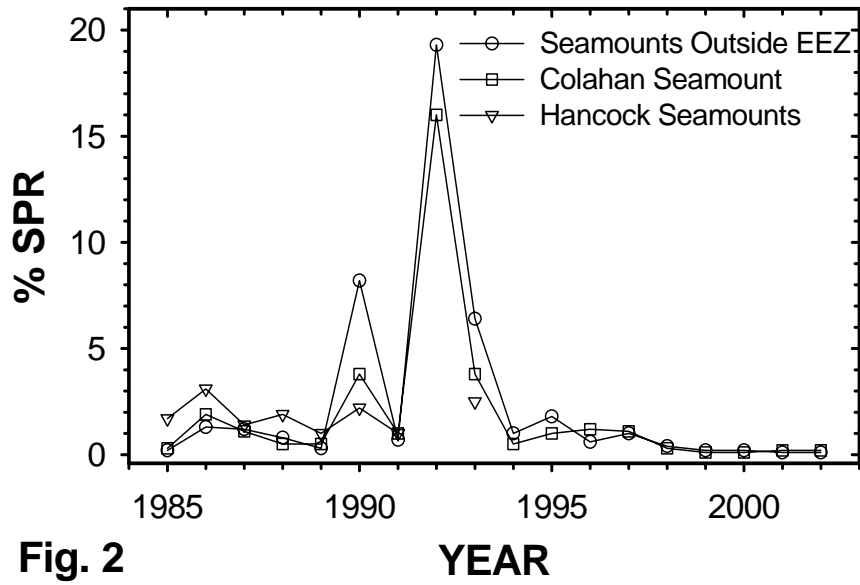
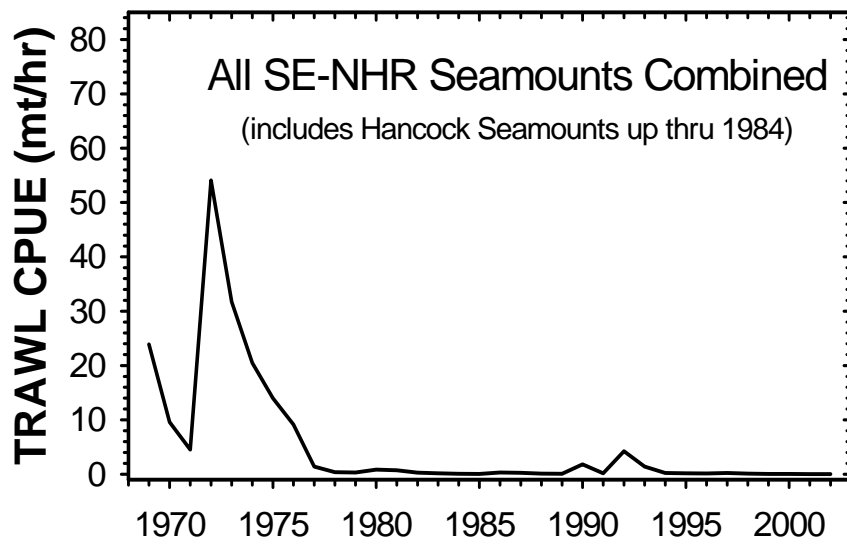
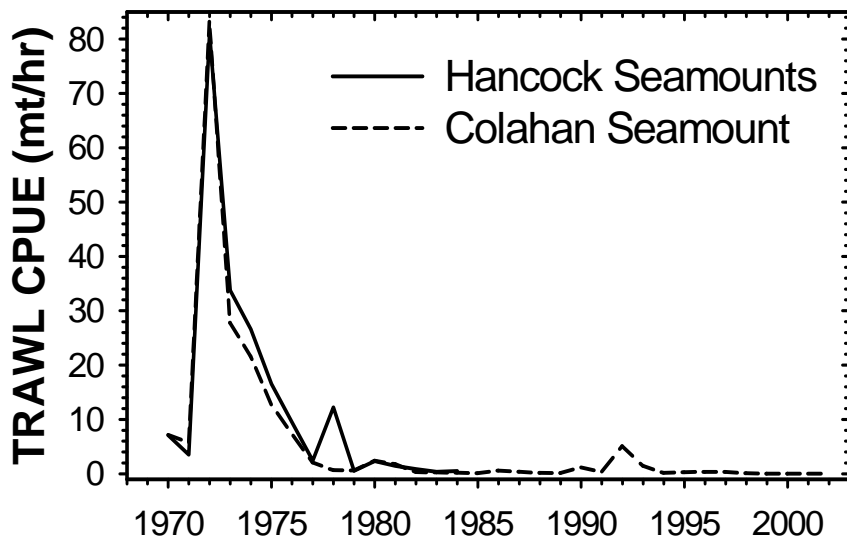


Fig. 2

## ARMORHEAD JAPAN TRAWL FLEET DATA



**Fig. 1a**



**Fig. 1b**

**YEAR**