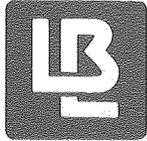


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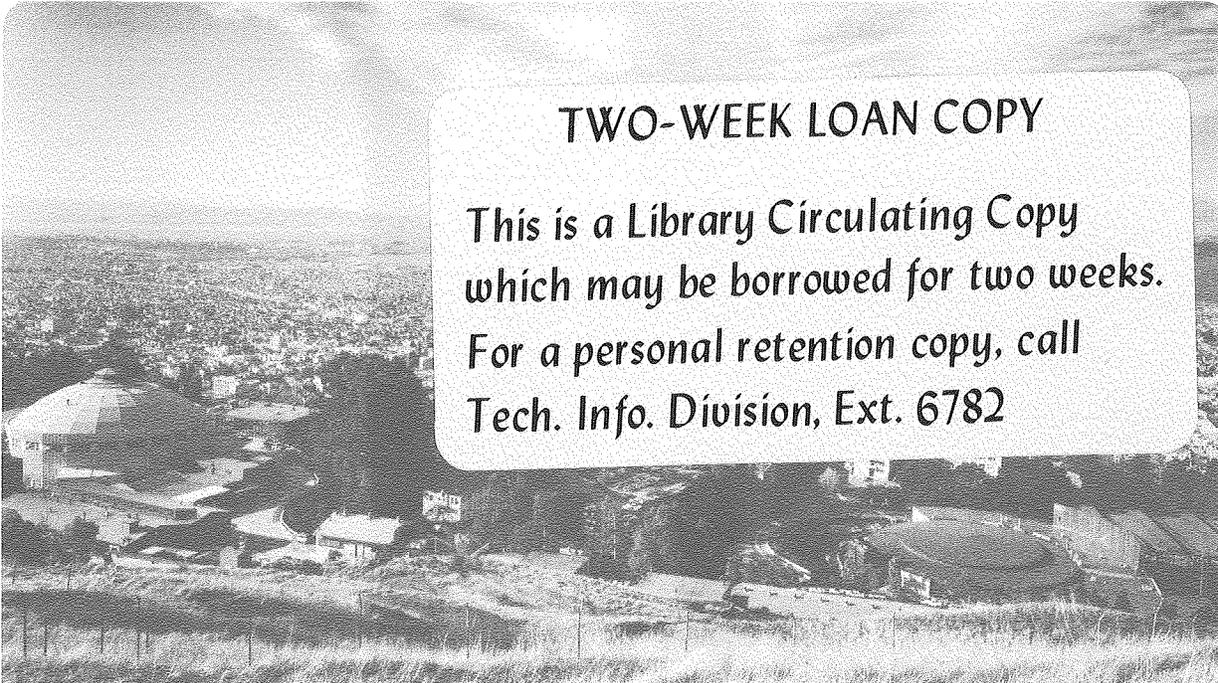
EARTH SCIENCES DIVISION

LIST OF FISH AT A PROPOSED OTEC SITE OFF KE-AHOLE
POINT, HAWAII, DERIVED FROM COMMERCIAL FISH RECORDS,
1959-1978

Anthony T. Jones and Constance J. Ryan

May 1981

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ABSTRACT

Fish species landed from an area encompassing a proposed Ocean Thermal Energy Conversion (OTEC) site off Ke-ahole Point, Island of Hawaii are presented. Over 60 species of fish representing 31 families recorded in the twenty years of commercial fish landings are listed with their scientific, local Hawaiian and common name.

INTRODUCTION

The fish species known to inhabit the offshore waters in the vicinity of a proposed Ocean Thermal Energy Conversion (OTEC) site are presented. A proposed Hawaiian OTEC site (HOTEC) is located off the northwest coast of the Island of Hawaii at $20^{\circ}00'$ N latitude and $156^{\circ}10'$ W longitude. The site is encompassed by the Hawaii Division of Fish and Game, Fishery Area 122 (Figure 1). Information on the occurrence of fish species in the area was derived from the commercial catch records of the Hawaii Division of Fish and Game from 1959 to 1978. A complete list of fish fauna from the Hawaiian Island Archipelago can be found in Gosline and Brock (1960) and in Tinker (1978).

COMMERCIAL FISH RECORD

A list of fish families and species landed from Area 122 appear phylogenetically in Table 1. In cases where the landed fish are not reported by species, the family is listed in Table 1 with the number of species known from the Hawaiian Islands. For example, when Muraenids are landed, only the family is reported to the Fish and Game by the local fishermen, therefore, Table 1 lists the family with the number of species from Hawaii. Some synonymies are included to aid the reader.

The majority of reported fish landings are recorded by the local fishermen using the Hawaiian or colloquial names. Table 2 lists the common and local Hawaiian names of the fishes included in the faunal list (Table 1). Some Hawaiian names correspond to more than one specific taxa. In cases where the fish's local name is not specific an attempt has been made to list the possible corresponding species. Some fish have more than one Hawaiian name, which often refers to various life history stages. For example, young bigeye scad (Selar crumenophthalmus) are called hahalua and mature adults are called akule. The common names listed are those used by the Hawaiian Fish and Game.

All members of the subclass Elasmobranchii landed from Area 122 are recorded as mano, a local name applied to sharks. There are about twenty species of sharks reported from Hawaii (Gosline and Brock, 1960; Kato, Springer and Wagner, 1967; Tinker, 1978). Kato, Springer and Wagner (1967) provide a key to the sharks of Hawaii.

All species listed are native to Hawaii except the blue-lined

snapper (Lutjanus kasmira). The blue-lined snapper was introduced into Hawaiian waters in 1958 and again in 1961 (Tinker, 1978).

The occurrence of ocean moonfish, Lampris regius, is rare in the Hawaiian waters with only two records according to Gosline and Brock (1960). The ocean moonfish closely resembles the Molids or ocean sunfishes which are frequently seen in Hawaii. The only report of a moonfish from the HOTEK area was in 1963.

A fish survey during the Mini-OTEC barge deployment and operation (June, 1979 to November, 1979) utilized camera and diver observations combined with interviews of commercial and charter fishermen to assess the attraction of fish to the platform and pipe. The following species were reported from the diver and camera observations: spotted triggerfish (Canthidermis maculatus), opelu (Decapterus pinnulatus), rainbow runners (Elagatis bipinnulatus), mahi mahi (Coryphaena hippurus), pilot fish (Naucrates ductor), white-tipped shark (Pterolaminops longimanus), kahala (Seriola dumerili), bigeye scad (Selar crumenophthalmus), filefish (Alutera scripta), rudderfish (Kyphosus cinerescens). Juvenile yellow tang (Zebrasoma flavescens), reef blenny (Istiblennius spp.) and damselfish (Chromis hanui) were also observed (ORCA, 1980). Fishermen interviewed reported catching or sighting mahi mahi, whale shark (Rhincodon typus), white-tipped shark, aku (Katsuwonus pelamis), ahi (Thunnus albacares), and rare captures of ono (Acanthocybium solandri) (ORCA, 1980).

CONCLUSION

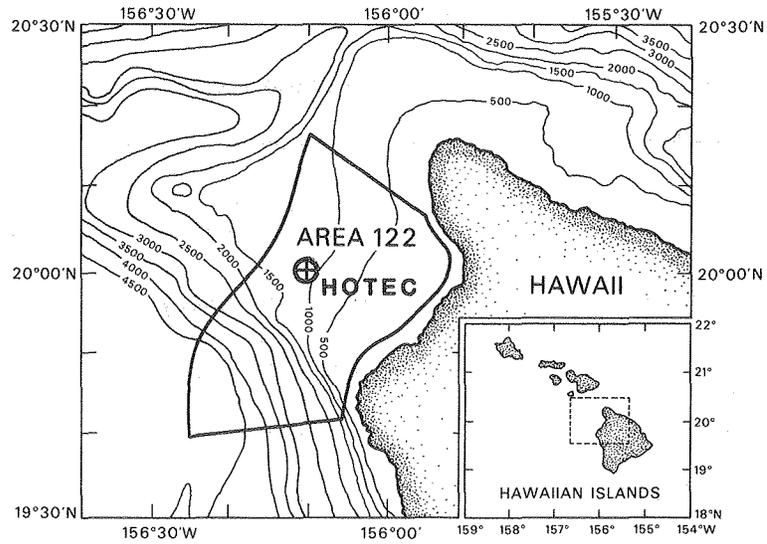
From the area around the proposed HOTEK site, over 60 species of fish from 31 families are represented in the twenty years of commercial fish records examined. These species are listed with local Hawaiian and common names in Table 2.

ACKNOWLEDGMENT

The authors would like to acknowledge the cooperation of the Hawaiian Division of Fish and Game in preparing this report. Special thanks to Margo Stahl who assisted in supplying the data source for this report. This work was supported by the Division of Ocean Energy Systems, U.S. Department of Energy under contract W-7405-ENG-48. We would also like to thank Dr. E. Hartwig and Dr. P. Wilde for their support.

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Figure 1. Map with location of Hawaiian Fish and Game Area 122 and HOTECH site at 20°00'N, 156°10'W. Contour intervals are in 500 meters. (Adapted from Wilde et al., 1980 and Hawaiian Division of Fish and Game, Fisheries Chart No. 2).

Table 1. List of the fish at the HOTEK site as derived from Hawaiian Division of Fish and Game commercial fish records, 1959 - 1978.

<u>MAJOR TAXA</u>	<u>SPECIES</u>
Elasmobranchii [= Chondrichthys]	21 spp. *
ALBULIDAE	<u>Albula vulpes</u>
MURAENIDAE	34 spp. *
CONGRIDAE	<u>Conger cinereus</u> [= <u>C. marginatus</u>]**
CLUPEIDAE	<u>Etrumeus micropus</u>
CHANIDAE	<u>Chanos chanos</u>
EXOCOETIDAE	13 spp.
BELONIDAE	3 spp.
HOLOCENTRIDAE	15 spp. <u>Myripristis</u> spp.
LAMPRIDAE	<u>Lampris regius</u> # [= <u>Lampris guttatus</u>]
SCORPAENIDAE	<u>Scorpaenopsis</u> spp.
SERRANIDAE	<u>Epinephelus quernus</u>
KUHLIIDAE	<u>Kuhlia sandvicensis</u>
PRIACANTHIDAE	4 spp.
APOGONIDAE	<u>Apogon kallopterus</u> [= <u>A. snyderi</u>]

<u>MAJOR TAXA</u>	<u>SPECIES</u>
<u>CARANGIDAE</u>	<u>Scomberoides lysan</u> [= <u>S. scanti-petri</u>] [= <u>Chlorinemus tolooparah</u>] <u>Elagatis bipinnulatus</u> <u>Seriola dumerili</u> <u>Decapterus</u> spp. <u>Selar crumenophthalmus</u> [= <u>Trachurops crumenophthalmus</u>] <u>Alectis</u> spp. <u>Gnathanodon speciosus</u> [= <u>Caranx speciosus</u>] <u>Caranx mate</u> <u>C. melampygus</u>
<u>CORYPHAENIDAE</u>	<u>Coryphaena hippurus</u>
<u>LUTJANIDAE</u>	<u>Pristipomoides seibodii</u> <u>P. zonatus</u> [= <u>Rooseveltia brighami</u>] [= <u>Tropidinus zonatus</u>] <u>P. filamentosus</u> [= <u>P. microlepis</u>] <u>Etelis marshi</u> <u>E. carbunculus</u> [= <u>E. evurus</u>] <u>Aprion virescens</u> <u>Aphareus rutilans</u> <u>Lutjanus kasmira</u> ##
<u>SPARIDAE</u>	<u>Monotaxis grandoculis</u>
<u>MULLIDAE</u>	<u>Mulloidichthys</u> spp. <u>M. pflugeri</u> <u>Parupeneus porphyreus</u> <u>P. multifasciatus</u>
<u>KYPHOSIDAE</u>	<u>Kyphosus bigibbus</u> [= <u>K. cinerascens</u>]

<u>MAJOR TAXA</u>	<u>SPECIES</u>
POMACENTRIDAE	<u>Abudefduf abdominalis</u>
MUGILIDAE	<u>Mugil cephalus</u>
SPHYRAENIDAE	<u>Sphyraena barracuda</u> <u>S. helleri</u>
POLYNEMIDAE	<u>Polydactylus sexfilis</u>
LABRIDAE	43 spp. <u>Xyrichtys pavo</u> [= <u>Iniistius pavoninus</u>] [= <u>Hemipteronotus pavoninus</u>] <u>Cheilio inermis</u> <u>Bodianus bilunulatus</u> [= <u>B. albotaeniatus</u>] <u>Coris flavovittatus</u>
SCARIDAE	12 spp. <u>Scarus perspicillatus</u>
ACANTHURIDAE	<u>Acanthurus</u> spp. <u>A. olivaceus</u> <u>A. triostegus</u> [= <u>A. sandvicensis</u>] <u>A. nigroris</u> <u>A. dussumieri</u> <u>Naso unicornis</u>
SCOMBRIDAE	<u>Acanthocybium solandri</u> <u>Scomber japonicus</u> <u>Euthynnus affinis</u> [= <u>E. yaito</u>] [= <u>E. alletteratus</u>] <u>Thunnus thynnus</u> [= <u>T. orientalis</u>] <u>T. alalunga</u> <u>T. albacares</u> [= <u>Neothunnus macropterus</u>] <u>T. obesus</u> [= <u>Parathunnus sibi</u>] <u>Katsuwonus pelamis</u> [= <u>Euthynnus pelamis</u>]

<u>MAJOR TAXA</u>	<u>SPECIES</u>
XIPHIDAE	<u>Xiphias gladius</u>
ISTIOPHORIDAE	<u>Tetrapterus angustirostris</u>
	<u>T. audax</u>
	[= <u>T. mitsukurii</u>]
	[= <u>Makaira audax</u>]
	<u>Istiophorus platypterus</u>
	[= <u>I. orientalis</u>]
	<u>Makaira nigricans</u>
	[= <u>M. ampla</u>]
	<u>M. indica</u>
	[= <u>Istiompax marlina</u>]
BALISTIDAE	19 spp.

*The number of species known from Hawaii is cited when fish records do not differentiate between species in a taxa.

**Brackets enclose recent synonymies as an aid to the reader.

#This rare species closely resembles frequently seen Molids or ocean sunfishes.

##Introduced species see text for dates and reference.

Table 2. List of local and common names of fish caught commercially at the HOTEK site.

<u>MAJOR TAXA</u>	<u>SPECIES NAME</u>	<u>LOCAL NAME</u>	<u>COMMON NAME</u>
Elasmobranchii [= Chondrichthys]	21 spp.*	Mano	Shark
ALBULIDAE	<u>Albula vulpes</u>	'O'io	Bone fish
MURAENIDAE	34 spp.*	Puhi	Moray eel
CONGRIDAE	<u>Conger cinereus</u> [= <u>C. marginatus</u>] **	Puhi (Tohe)	White eel
CLUPEIDAE [= DUSSUMIERIIDAE]	<u>Etrumeus micropus</u>	Makiawa	Sardine
CHANIDAE	<u>Chanos chanos</u>	Awa	Milk fish
EXOCOETIDAE	13 spp.	Malolo	Flying fish
BELONIDAE	3 spp.	Aha aha	Needle fish
HOLOCENTRIDAE	15 spp. 15 spp. <u>Myripristis amaenus</u> # [= <u>M. argyromus</u>] <u>M. berndti</u> # [= <u>M. murdjan</u>] <u>M. kuntee</u> # [= <u>M. chryseres</u>] [= <u>M. multiradiata</u>]	Alaihi Uukanipo U'u U'u U'u Pa'u'u	Squirrel fish Squirrel fish Squirrel fish Squirrel fish Squirrel fish Squirrel fish
LAMPRIDAE	<u>Lampris regius</u> ## [= <u>Lampris guttatus</u>]	Opah	Ocean moonfish
SCORPAENIDAE	<u>Scorpaenopsis diabolus</u> # [= <u>S. gibbosa</u>] <u>S. cacopsis</u> #	Nohu Nohu	Scorpion fish Scorpion fish
SERRANIDAE	<u>Epinephelus quernus</u>	Hapu'upu'u	Sea bass
KUHLIIDAE	<u>Kuhlia sandvicensis</u>	Aholehole	Mountain bass
PRILACANTHIDAE	4 spp.	Aweoweo	Red bigeye
APOGONIDAE	<u>Aogon kallopterus</u> [= <u>A. Snyderi</u>]	Upa palu	Cardinal fish

Table 2 continued

<u>MAJOR TAXA</u>	<u>SPECIES NAME</u>	<u>LOCAL NAME</u>	<u>COMMON NAME</u>	
CARANGIDAE	<u>Scomberoides lysan</u> [= <u>S. scanti-petri</u>] [= <u>Chorinemus tolooparah</u>]	Lae	Leatherback	
	<u>Elagatis bipinnulatus</u>	Kamanu	Hawaiian salmon	
	<u>Seriola dumerili</u>	Kahala	Amberjack	
	<u>Decapterus macarellus</u> # [= <u>D. pinnulatus</u>]	'Opelu	Mackerel scad	
	<u>D. maruadai</u> #	'Opelu	Mackerel scad	
	<u>Selar crumenophthalmus</u> [= <u>Trachurops crumenophthalmus</u>]	Akule (Hahalau)	Bigeye scad	
	<u>Alectis ciliaris</u> #	Ulua kihikihi	Thread crevally	
	<u>A. indica</u> #	Ulua kihikihi	Thread crevally	
	<u>Gnathanodon speciosus</u> [= <u>Caranx speciosus</u>]	Paopao	Yellow Ulua	
	<u>Caranx mate</u>	Omaka	Yellow-tailed scad	
	<u>C. melampygus</u>	Ulua omilu	Blue crevally	
	CORYPHAENIDAE	<u>Coryphaena hippurus</u> #	Mahi mahi	Dolphin
	LUTJANIDAE	<u>Pristipomoides seiboldii</u>	Kalikali	Pink snapper
<u>P. zonatus</u> [= <u>Rooseveltia brighami</u>] [= <u>Tropidinus zonatus</u>]		Ukikiki	Snapper	
<u>P. filamentosus</u> [= <u>P. microlepis</u>]		'Opakapaka	Red snapper	
<u>Etelia marshi</u>		'Ula'ula (Ehu)	Red Snapper	
<u>E. carbunculus</u> [= <u>E. evurus</u>]		'Ula'ula koae	Red snapper	
<u>Aprion virescens</u>		Uku	Gray snapper	
<u>Aphareus rutilans</u>		Lehi	Snapper	
<u>Lutjanus kasmira</u> †		Taape	Blue-lined snapper	
SPARIDAE	<u>Monotaxis grandoculis</u>	Mu	Porgy	
MULLIDAE	<u>Mulloidichthys</u> spp.	Weke	Goat fish	
	<u>M. vanicolensis</u> # [= <u>M. auriflamma</u>]	Weke'ula	Red goat fish	
	<u>M. pflugeri</u> #	Weke'ula	Red goat fish	
	<u>M. pflugeri</u>	Moelua	Red goat fish	
	<u>Parupeneus porphyreus</u>	Kumu	Goat fish	
<u>P. multifasciatus</u>	Moano	Goat fish		
KYPHOSIDAE	<u>Kyphosus bigibbus</u> [= <u>K. cinereacens</u>]	Nenu	Rudder fish	

Table 2 continued

<u>MAJOR TAXA</u>	<u>SPECIES NAME</u>	<u>LOCAL NAME</u>	<u>COMMON NAME</u>
POMACENTRIDAE	<u>Abudefduf abdominalis</u>	Maomao	Sargent major
MUGILIDAE	<u>Mugil cephalus</u>	'Ama'ama	Mullet
SPHYRAENIDAE	<u>Sphyraena barracuda</u> <u>S. helleri</u>	Kaku Kawelea	Barracuda Japanese barracuda
POLYNEMIDAE	<u>Polydactylus sexfilis</u>	Moi	Thread-fin
LABRIDAE	43 spp. <u>Xyrichtys pavo</u> [= <u>Inlistius pavoninus</u>] [= <u>Hemipteronotus pavoninus</u>] <u>Cheilio inermis</u> <u>Bodianus bilunulatus</u> [= <u>B. albotaeniatus</u>] <u>Coris flavovittata</u>	E'a Laenihi Kupoupou 'A'awa Hilu	Wrasse Peacock wrasse Mongoose fish Spot wrasse Wrasse
SCARIDAE	12 spp. 12 spp. <u>Scarus perspicillatus</u>	Hanui Uhu Panuhunuhu	Parrot fish Parrot fish Parrot fish
ACANTHURIDAE	<u>Acanthurus olivaceus</u> <u>A. triostegus</u> [= <u>A. sandvicensis</u>] <u>A. nigroris</u> <u>A. dussumieri</u> <u>A. xanthopterus</u> # <u>A. mata</u> # <u>Naso unicornis</u>	Na'ena'e Manini Maiko Palani Pualu Pualu Kala	Orange spot tang Convict tang Surgeon fish Surgeon fish Surgeon fish Surgeon fish Surgeon fish
SCOMBRIDAE	<u>Acanthocybium solandri</u> <u>Scomber japonicus</u> <u>Euthynnus affinis</u> [= <u>E. yaito</u>] [= <u>E. alletteratus</u>] <u>Thunnus thynnus</u> [= <u>T. orientalis</u>] <u>T. alalunga</u> <u>T. albacares</u> [= <u>Neochunnus macropterus</u>] <u>T. obesus</u> [= <u>Parathunnus sibi</u>] <u>Katsuwonus pelamis</u> [= <u>Euthynnus pelamis</u>]	Ono Saba Kawa kawa Ahi Ahi pahala Ahi Ahi Aku	Wahoo Japanese mackerel Little tuna Bluefin tuna Albacore tuna Yellowfin tuna Biseve tuna Skipjack tuna

Table 2 continued

<u>MAJOR TAXA</u>	<u>SPECIES NAME</u>	<u>LOCAL NAME</u>	<u>COMMON NAME</u>
XIPHIIDAE	<u>Xiphias gladius</u>	A'u	Broadbill swordfish
ISTIOPHORIDAE	<u>Tetrapterus angustirostris</u>	A'u	Short-nosed spearfish
	<u>T. audax</u>	A'u	Striped marlin
	[= <u>T. mitsukurii</u>]		
	[= <u>Makaira audax</u>]		
	<u>Istiophorus platypterus</u>	Au-lepe	Sailfish
	[= <u>I. orientalis</u>]		
BALISTIDAE	<u>Makaira nigricans</u>	A'u	Pacific blue marlin
	[= <u>M. ampla</u>]		
	<u>M. indica</u>	A'u	Black marlin
	[= <u>Istiompax marlina</u>]		
	19 spp.	Humuhumu	Trigger fish

*The number of species known from Hawaii is cited when fish records do not differentiate between species in a taxa.

**Brackets enclose recent synonymies as an aid to the reader.

#Closely related species with same local name.

##This rare species closely resembles frequently seen Molids or ocean sunfishes.

§Introduced species see text for dates and reference.

