

## Section 20

# FORESTS, FISHERIES, AND MINING

This section presents data on forests and forest products, commercial fishing, and mining and mineral products.

The most recent available statistics show 1.2 million acres of forest and water reserve and 948,000 acres of commercial timberland in the State, most of it on the Big Island. About 46,000 acres had been planted in eucalyptus and other species of trees by mid-1983. Forest products harvested in 1977 had a value of \$3.5 million, including \$2.3 million from logs for fiber. Forest and brushland fires burned 19,000 acres in fiscal 1983.

The commercial fish catch in fiscal year 1982 amounted to 9.2 million pounds and had a value of \$11 million. Ahi (Yellowfin) accounted for about 30 percent of the total value. Other important species are aku (Skipjack), mahimahi, opakapaka, ono, akule, opelu and Pacific Blue Marlin. Commercial fishermen numbered 2,940; they operated some 1,300 fishing vessels, serving about 119 fishery wholesaling and processing establishments.

The value of mineral production reached \$41 million in 1983, most of it in cement (\$17 million) and stone (\$23 million). The 1982 total was well below the all-time high reached in 1979.

Important sources of data on these subjects are the United States Census of Agriculture, United States Census of Mineral Industries and reports and records of the U.S. Bureau of Mines, National Marine Fisheries Service, and Hawaii State Department of Land and Natural Resources, Aquatic Resources Division and Forestry and Wildlife Division. Historical Statistics of Hawaii, Section 14, summarizes the data for earlier periods. Comparable Mainland statistics are reported in the Statistical Abstract of the United States: 1984, Sections 25, 26 and 27.

Table 589.-- FOREST ACREAGE, BY ISLANDS: 1970-1983

Island	Forest and water reserve, 1983 <sup>1/</sup> (acres)	Forest land, 1970 (acres)			Planted forest, June 30, 1983 (acres)	
		Total	Commercial <sup>2/</sup>	Noncommercial <sup>3/</sup>	Planted in preceding year	Total standing
State total	1,186,462	1,986,400	947,800	1,038,600	59	46,279
Hawaii .....	697,361	1,152,500	569,400	583,100	29	17,835
Maui .....	155,247	239,800	67,500	172,300	30	11,546
Kahoolawe .....	-	15,800	-	15,800	-	-
Lanai .....	6,150	43,900	4,500	39,400	-	512
Molokai .....	46,445	78,100	34,000	44,100	-	3,205
Oahu .....	119,319	205,300	126,500	78,800	-	7,036
Kauai .....	161,970	219,900	145,900	74,000	-	6,145
Niihau .....	-	31,100	-	31,100	-	-
Other islands ..	-	-	-	-	-	-

<sup>1/</sup> Forest and water reserve within conservation district, as of June 30.

<sup>2/</sup> Includes federal military, state, miscellaneous corporate, and miscellaneous individual forest land.

<sup>3/</sup> Unproductive or productive-reserved.

Source: Hawaii State Department of Land and Natural Resources, Division of Forestry and Wildlife, records.

Table 590.-- COMMERCIAL TIMBERLAND OWNERSHIP AND VOLUME OF  
SAWTIMBER AND GROWING STOCK: 1977

Subject	Amount
Commercial timberland (1,000 acres) .....	948
Federally owned or managed .....	12
State or county .....	442
Private .....	494
Sawtimber net volume (million board feet) .....	1,047
Softwood only .....	17
Growing stock, net volume (million cubic feet) .....	202
Softwood only .....	4

Source: U. S. Forest Service study cited in Statistical Abstract of the United States: 1984, p. 693.

Table 591.-- FOREST AND BRUSHLAND FIRES: 1982 AND 1983

[Years ended June 30]

County	Number of fires		Acres burned	
	1982	1983	1982	1983
State total .....	255	170	6,919	19,130
Hawaii .....	104	55	2,155	15,373
Maui .....	94	74	4,461	851
Honolulu .....	46	26	260	2,697
Kauai .....	11	15	43	210

Source: Hawaii State Department of Land and Natural Resources, Division of Forestry and Wildlife, records.

Table 592.-- FOREST PRODUCTS HARVESTED: 1977

Forest product	Output		Unit price (dollars)	Total value (dollars)
	Unit	Amount		
All products .....	...	...	...	3,465,233
Logs for lumber .....	MBF <u>1</u> .....	2,750	209	574,833
Logs for craftwood .....	Cords <u>2</u> / ..	299	224	51,330
Logs for fiber .....	BDT <u>3</u> / .....	55,502	41	2,310,500
Tree fern .....	Cubic feet	95,000	1.42	135,000
Fuelwood from trees .....	Cords <u>2</u> / ..	4,191	47	194,563
Fuelwood for charcoal ....	Cords <u>2</u> / ..	800	34	26,820
Fuel from mill residue ...	Tons .....	5,000	10.50	52,500
Round posts .....	Posts .....	32,700	3.14	102,604
Split posts .....	Posts .....	3,525	2.93	10,321
Driftwood .....	Cords <u>2</u> / ..	2	300	600
Pallets .....	Number ....	20	20	400
Bamboo .....	Lineal feet	18,844	0.04	742
Kukui nuts .....	Tons .....	13.86	362	5,020

1/ Thousand board feet.

2/ One cord equals 128 cubic feet

3/ Bone dry ton, equal to 2,000 lbs. of wood at 0 percent moisture content.

Source: Hawaii State Department of Land and Natural Resources, Division of Forestry, Hawaiian Forest Products 1977, table II.

Table 593.-- FISHERY OPERATING UNITS AND LANDINGS: 1973 TO 1983

Year	Commer- cial fisher- men <u>1/</u>	Vessels and boats <u>2/</u>		Fishery estab- lish- ments <u>3/</u>	Landings <u>4/</u>	
		Motor vessels	Boats		Quantity (1,000 lb.)	Value (\$1,000)
1973 ...	2,091	104	1,097	125	14,035	6,115
1974 ...	1,992	97	1,066	123	10,990	6,028
1975 ...	2,197	109	1,278	132	9,209	6,313
1976 ...	2,367	101	1,336	135	14,761	8,879
1977 ...	2,574	101	(NA)	126	13,288	10,180
1978 ...	2,409	(NA)	1,100	(NA)	12,787	12,100
1979 ...	2,447	113	1,028	(NA)	13,664	10,659
1980 ...	2,497	134	1,055	(NA)	11,435	11,870
1981 ...	2,572	147	1,119	(NA)	13,396	18,338
1982 ...	2,480	(NA)	1,175	(NA)	14,245	14,426
1983 ...	2,940	190	1,119	119	28,829	17,896

NA Not available.

1/ Persons licensed as commercial fishermen by the Hawaii State Department of Land and Natural Resources, during years beginning July 1.

2/ A vessel is defined as a craft with a capacity of 5 net tons or more; a boat, as a craft with a capacity of less than 5 net tons.

3/ Fishery wholesaling and processing establishments.

4/ Data may differ from corresponding totals reported by the Hawaii State Department of Land and Natural Resources, Aquatic Resources Division, which, unlike the NMFS series shown here, include unsold fish.

Source: U.S. Department of Commerce, National Marine Fisheries Service, Fishery Statistics of the United States (annual) and records; Hawaii State Department of Land and Natural Resources, Conservation and Resources Enforcement Division, records; Hawaii State Department of Transportation, Harbors Division, Report of Undocumented Vessel Registration (annual).

Table 594.-- COMMERCIAL FISHING: 1962 TO 1983

[Years ended June 30]

Year	Number of commercial fishermen	Commercial fish catch <sup>1/</sup>		
		Pounds caught	Pounds sold	Value to primary producers (dollars)
1962 .....	940	13,800,761	13,173,259	2,870,702
1963 .....	808	10,685,604	10,629,701	2,539,189
1964 .....	805	12,013,869	11,970,398	2,732,125
1965 .....	717	17,105,515	17,053,925	3,340,651
1966 .....	715	15,985,626	15,924,854	3,318,803
1967 .....	801	12,344,555	12,274,531	3,146,177
1968 .....	760	12,828,387	12,740,307	3,253,538
1969 .....	1,028	10,065,623	9,974,455	2,798,424
1970 .....	1,264	9,786,726	9,588,319	3,585,166
1971 .....	1,373	15,176,525	14,945,539	4,633,875
1972 .....	1,544	15,577,669	15,246,519	5,536,521
1973 .....	1,677	14,029,491	13,719,284	5,676,783
1974 .....	2,085	13,997,774	13,660,574	6,234,924
1975 .....	1,991	10,801,441	10,404,019	6,242,614
1976 .....	2,283	11,893,141	11,332,659	7,508,395
1977 .....	2,368	15,298,515	14,763,816	9,433,781
1978 .....	2,574	13,672,061	13,139,142	11,115,964
1979 .....	2,447	12,310,524	11,890,241	12,673,328
1980 .....	2,525	10,418,964	9,946,065	10,497,456
1981 .....	2,577	10,890,468	10,465,731	11,828,575
1982 .....	2,525	9,178,789	8,824,348	10,754,276
1983 .....	2,480	7,841,959	7,529,178	10,506,860

<sup>1/</sup> Represents the total catches of all licensed commercial fishers. Includes both sea and pond catch, but excludes coral harvests. Particularly for years since 1979, data may be incomplete due to unreported aku (skipjack tuna) boat and flagline boat catches.

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, Commercial Fish Landings for Fiscal Year (annual), as revised, and records.

Table 595.-- COMMERCIAL FISH CATCH, BY SPECIES: 1983

[Year ended June 30, 1983]

Species <u>1/</u>	Pounds caught	Pounds sold	Value (dollars)
Total catch .....	7,859,801	7,546,185	10,519,550
Sea catch, all species <u>2/</u> .....	7,839,341	7,526,522	10,486,845
Aku (Skipjack) .....	2,427,182	2,385,443	2,126,318
Ahi (Yellowfin) .....	1,669,191	1,599,295	2,536,231
Opelu .....	450,940	447,138	581,120
Akule .....	381,580	353,082	391,754
Pacific blue marlin .....	372,199	328,328	251,000
Ahipalaha .....	370,349	369,107	270,543
Opakapaka .....	238,277	230,993	721,118
Ono .....	220,196	202,737	505,942
Mahimahi .....	199,106	184,210	552,534
Hahalalu .....	162,677	159,321	179,787
Ahi (Bigeye) .....	154,936	154,273	369,906
Uku .....	121,584	117,345	305,683
Kahala .....	104,540	91,772	65,846
Ulua .....	97,669	91,726	148,364
Onaga .....	72,949	70,702	250,861
Lobster .....	18,205	17,508	109,066
Pond catch, all species .....	20,460	19,663	32,706

1/ Shown separately for all species over 100,000 lb. or \$100,000.

2/ Including species not shown separately.

Source follows next table.

Table 596.-- COMMERCIAL FISH LANDINGS, BY ISLANDS: 1983

[Year ended June 30, 1983]

Island	Pounds caught	Pounds sold	Value (dollars)
State total .....	7,859,801	7,549,185	10,520,549
Hawaii .....	2,492,745	2,416,510	3,686,332
Maui .....	889,679	849,808	1,046,369
Lanai .....	22,658	21,054	24,190
Molokai .....	31,708	29,133	38,797
Oahu .....	3,757,502	3,622,051	4,763,132
Kauai .....	665,509	610,629	961,729

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, Commercial Fish Landings for Fiscal Year -- July, 1982 through June, 1983.

Table 597.-- LIFE FORMS IN HAWAIIAN WATERS

Life form	Approximate number
Species of fish .....	700
Species of seaweed (algae) .....	400
Species of mollusks .....	1,000
Other known taxa of invertebrates .....	1,350

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, Hawaii Fisheries Statistics System Design Study (draft report, August 1983), p. 7.



Table 598.-- FISH POPULATIONS AROUND SELECTED SHORELINE AREAS ON OAHU  
AND MAUI: YEAR ENDED JUNE 30, 1983

Location	Species	Individuals	Estimated standing crop (lb. per acre)
Marine Life Conservation Districts:			
Hanauma Bay, Oahu .....	87	2,400	3,658
Pupukea, Oahu .....	82	1,042	168
Molokini Shoals, Maui <u>1/</u> .....	43	685	640
Artificial reefs:			
Waianae, Oahu .....	47	559	59
Maunalua Bay, Oahu .....	46	795	196
Shoreline Fisheries Management Areas:			
Waikiki-Diamond Head, Oahu <u>2/</u> .....	130	(NA)	254
Olowalu, Maui <u>3/</u> .....	25	252	173
Others:			
Barbers Point, Oahu .....	43	620	93
Waianae Outfall, Oahu .....	51	187	89

NA Not available.

1/ Fish count transects counted in shallow areas, not over established stations.

2/ Annual mean monthly value. Average standing crops of fishes in earlier fiscal years were: 1978, 114 pounds per acre, 1979, 217; 1980, 447; 1981, 358; and 1982, 151. All legal fishing methods were permitted in fiscal years 1978 and 1982, only pole-and-line fishing was permitted in fiscal 1981, and the area was closed to all fishing in fiscal 1979, 1980, and 1983.

3/ Potential Management Area.

Source follows next table.

Table 599.--MOST ABUNDANT FISH SPECIES AT HANAUMA BAY AND THE  
 WAIKIKI-DIAMOND HEAD AREA: 1982-1983

[Three leading species in each area, based on both numbers  
 per acre and pounds per acre]

Location and species	Abundance		Standing crop	
	Rank	Number per acre	Rank	Pounds per acre
Hanauma Bay: <u>1/</u>				
Manini .....	1	1,714.0	4	372.3
Aholehole .....	2	479.3	9	137.2
Yellow-eyed damsel fish .....	3	479.3	20	39.9
Nenue .....	5	358.8	1	474.6
Pualu .....	9	190.3	2	445.0
'Ama'ama .....	16	130.7	3	373.5
Waikiki: <u>2/</u>				
Manini .....	1	259.5	2	33.7
Hinalea lau-wili .....	2	179.1	4	17.3
Surgeon fish (Acanthurus nigrofuscus) .....	3	167.7	3	27.6
Kala .....	6	64.8	1	45.9

1/ Hanauma Bay Marine Life Conservation District, surveyed December 14, 1982.

2/ Waikiki Shoreline Fisheries Management Area, surveyed 21 times during fiscal year 1983.

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, Job Progress Report, Statewide Marine Research and Surveys, Survey of Fish and Habitat, July 1, 1982 to June 30, 1983.

Table 600.-- MINERAL INDUSTRIES: 1963 TO 1982

[Excluding mines at manufactures]

Subject	1963	1967	1972	1977	1982
Number of establishments <sup>1/</sup> .....	44	12	15	7	13
With 20 employees or more .....	4	3	5	2	5
All employees:					
Number (1,000) .....	.3	.2	.3	.1	.2
Payroll (million dollars) .....	1.7	1.6	2.4	1.9	5.6
Production, development, and ex- ploration workers:					
Number (1,000) .....	.2	.2	.2	.1	.2
Hours (millions) .....	.6	.4	.4	.2	.4
Wages (million dollars) .....	1.5	1.3	1.8	1.5	3.9
Value added in mining (million dollars) .....	4.9	5.0	9.0	8.1	14.8
Cost of supplies used, purchased machinery installed, etc. (million dollars) .....	2.1	2.3	4.1	2.9	6.5
Value of shipments and receipts (million dollars) .....	6.5	5.5	11.0	9.7	17.6
Capital expenditures (million dollars) .....	.5	1.8	2.0	1.3	3.7

<sup>1/</sup> After 1963, data for companies without paid employees were excluded from the census of mineral industries.

Source: U.S. Bureau of the Census, 1977 Census of Mineral Industries, Geographic Area Series, Pacific Division, MIC77-A-9 (March 1981), table 1; 1982 Census of Mineral Industries, MIC82-SUM-2(P), United States (Geographic Area Statistics) (July 1984), table 1.

Table 601.-- NONFUEL MINERAL PRODUCTION SUMMARY: 1973 TO 1983

[Production as measured by mine shipments, sales, or marketable production, including consumption by producers]

Year	Quantity (1,000 short tons)		Value (\$1,000)			
	Cement	Stone	Total	Cement	Stone	Other minerals
1973 .....	469	7,180	35,147	13,750	18,466	2,931
1974 .....	502	7,638	42,042	17,111	21,370	3,561
1975 .....	469	7,569	49,710	20,704	25,319	3,687
1976 .....	339	6,092	42,252	18,410	21,193	2,649
1977 .....	330	5,759	39,980	16,922	19,880	3,178
1978 .....	452	6,027	52,743	26,454	23,840	2,449
1979 .....	481	6,869	63,904	30,423	28,969	4,512
1980 .....	371	6,341	59,676	24,682	30,645	4,349
1981 .....	312	6,036	58,727	23,831	31,407	3,489
1982 <u>1/</u> ..	233	4,500	46,889	18,676	26,604	1,609
1983 <u>2/</u> ..	205	4,500	41,173	16,770	23,003	1,400

1/ Revised from Data Book 1983, table 521.

2/ Preliminary.

Source: U.S. Department of the Interior, Bureau of Mines, Minerals Yearbook (annual); Minerals in the Economy of Hawaii (annual, 1978 and 1979); and "The Mineral Industry of Hawaii," Mineral Industry Surveys (annual).

Table 602.-- NONFUEL MINERAL PRODUCTION: 1982 AND 1983

[Production as measured by mine shipments, sales, or marketable production, including consumption by producers]

Mineral	Quantity (1,000 short tons)		Value (\$1,000)	
	1982 <u>1/</u>	1983 <u>2/</u>	1982 <u>1/</u>	1983 <u>2/</u>
Total .....	(X)	(X)	46,889	41,173
Cement:				
Portland .....	227	200	18,122	16,300
Masonry .....	6	5	554	470
Sand and gravel (construction)	449	400	1,221	1,000
Stone:				
Crushed .....	4,500	4,500	26,600	23,000
Dimension .....	(Z)	(Z)	4	3
Other nonmetals .....	(X)	(X)	388	400

X Not applicable.

Z Less than 500 short tons.

1/ Revised from Data Book 1983, table 522.

2/ Preliminary.

Source: U.S. Bureau of Mines, "The Mineral Industry of Hawaii in 1983," Mineral Industry Surveys (January 13, 1984).