

## 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 reserve and 948,000 acres of commercial forest in the State, most of it on the Big Island. More than 49,000 acres had been planted in eucalyptus and other species of trees by 1977. Primary forest products harvested in 1969 (the most recent year available) had a value of \$331,000. Almost 900 forest and brushland fires burned 6,500 acres in 1977. According to a 1974 compilation, the tallest tree in the State is a 203-foot eucalyptus saligna.

The commercial fish catch in fiscal 1977 was 15.3 million pounds and had a value of \$9.4 million. *Aku* (Skipjack) accounted for 41 percent of the total value. Other important species were *ahi*, *akule*, *opelu*, and *mahimahi*. Commercial fishermen numbered 2,367; they operated 1,437 fishing vessels, serving 44 fishery wholesaling and processing establishments.

The value of mineral production reached \$44 million in 1977, most of it in cement and stone. The all-time high was \$49.7 million, recorded in 1975.

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, Fish and Game Division and Forestry Division. Comparable Mainland statistics are reported in the *Statistical Abstract of the United States: 1977*, Sections 25, 26, and 27.

**Table 338.—FOREST RESERVE, TREES PLANTED, AND FOREST FIRES:  
1967 TO 1977**

Year	Forest reserve <sup>1</sup> (1,000 acres)	Acres planted in trees <sup>2</sup>	Forest and brushland fires <sup>3</sup>	
			Number <sup>4</sup>	Acres burned
1967 .....	1,196	2,404	16	6,572
1968 .....	1,196	2,039	25	13,339
1969 .....	1,196	1,499	34	45,523
1970 .....	1,196	1,539	62	14,245
1971 .....	1,196	776	49	1,951
1972 .....	1,196	361	67	8,190
1973 .....	1,196	162	75	17,968
1974 .....	1,196	88	36	2,640
1975 .....	1,196	137	45	3,438
1976 .....	1,196	324	64	6,881
1977 .....	1,196	20	888	6,495

<sup>1</sup> As of June 30. Effective July 10, 1961, the area previously known as the forest and water reserve was designated the forest and water reserve within the conservation district. Data include both governmental and private land.

<sup>2</sup> Years ended June 30. Data refer to acreage planted in forest reserves.

<sup>3</sup> Calendar years.

<sup>4</sup> Increase after 1976 reflects improved reporting of smaller forest and brushland fires.

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

**Table 339.—AREA OF FOREST LAND, 1970, AND PLANTED FOREST, 1977, BY ISLAND**  
[In acres.]

Island	Forest land, 1970		Area of planted forest, to 1977 <sup>3</sup>
	Total <sup>1</sup>	Commercial <sup>2</sup>	
State total .....	1,986,400	947,800	49,309
Niihau .....	31,100	—	—
Kauai .....	219,900	145,900	5,280
Oahu .....	205,300	126,500	7,218
Molokai .....	78,100	34,000	2,847
Lanai .....	43,900	4,500	512
Kahoolawe .....	15,800	—	—
Maui .....	239,800	67,500	10,670
Hawaii .....	1,152,500	569,400	22,782

<sup>1</sup> Includes commercial (938,300 acres), unproductive (933,700), and productive-reserved (114,400).

<sup>2</sup> Includes Federal military (12,300), State (428,100), miscellaneous corporate (294,900), and miscellaneous individual (203,000). Data revised since publication in *Data Book 1977*, table 301.

<sup>3</sup> Chiefly Eucalyptus, other hardwoods, and conifers. Includes arboretum plantings.

Source: Hawaii State Department of Land and Natural Resources, Forestry Division, records; U.S. Forest Service, Institute of Pacific Islands Forestry, records.

**Table 340.—PRIMARY FOREST PRODUCTS HARVESTED: 1958 TO 1969**

Subject	Total	Sawlogs	Craftwood	Veneer logs	Fuelwood	Posts	Treefern
<b>Production:<sup>1</sup></b>							
1958 .....	...	405	510	—	1,300	65.0	100
1960 .....	...	850	100	30	1,500	37.0	115
1963 .....	...		913	—	847	22.0	118
1967 .....	...	3,925	196	—	720	7.1	143
1969 .....	...	1,650	422	1,056	1,720	10.1	55
<b>Average unit value (\$):</b>							
1958 .....	...	100	240	—	14.50	0.83	0.35
1960 .....	...	70	200	300	30.00	0.60	0.38
1963 .....	...		160	—	22.43	1.05	0.33
1967 .....	...	40	300	—	38.89	1.69	0.52
1969 .....	...	52	230	47	31.40	1.58	0.49
<b>Total value (\$1,000):</b>							
1958 .....	269	40	121	—	19	54	35
1960 .....	197	57	20	9	45	22	44
1963 .....	230		149	—	19	23	39
1967 .....	334	161	58	—	28	12	75
1969 .....	331	86	98	50	54	16	27

<sup>1</sup> Sawlogs, craftwood, and veneer logs in 1,000 board feet, fuelwood in cords, posts in 1,000 pieces, and treefern in 1,000 cubic feet.

Source: U.S. Department of Agriculture, Pacific Southwest Forest and Range Experiment Station, *Forest Products Harvested in Hawaii - 1969*, Research Note PSW-239 (1971), p. 2.

**Table 341.—LARGEST REPORTED TREES OF SPECIFIED NATIVE AND EXOTIC SPECIES: 1974**

Species	Circum. at 4½ ft. (ft., in.)	Height (feet)	Spread (feet)	Location
NATIVE				
Acacia koa (koa) <sup>1</sup> .....	37-4	140	128	Keauhou, Ka'u
Aleurites moluccana (kukui) .....	10-7	67	59	Pahala, Ka'u
Calophyllum inophyllum (kamani) .....	18-6	59	81	Malama-ki, Puna
Metrosideros collina ('ohi'a-lehua) .....	17-10	84	78	Waipunalei, Hilo
Pandanus tectorius (hala) .....	4-6	35	40	Keaau, Hilo
Santalum pilgeri ('ili'-ahi, or sandalwood)	7-8	65	48	Honomolino, S. Kona
Sapindus saponaria (wingleaf soapberry)	10-1	106	84	Hawaii Vol. Nat. Park
Sophora chrysophylla (mamani) .....	12-2	39	42	Mauna Kea For. Res.
EXOTIC				
Araucaria hetrophylla (Norfolk I. pine) .	16-6	140	75	Lanai City, Lanai
Carica papaya (papaya) .....	4-10	60	12	Kailua, N. Kona
Cassia grandis (pinkshower) .....	10-11	55	40	Reed's Island, Hilo
Casuarina cunninghamiana (river-oak iron wood) .....	6-9	80	42	Kohala Forest Res.
Cocos nucifera (coconut) .....	4-8	94	28	Arboretum, Hilo
Delonix regia (royal poinciana) .....	13-6	48	62	Maunawili, Koolaupoko
Eucalyptus deanei .....	11-0	157	60	Honaunau For. Res.
Eucalyptus saligna .....	12-11	203	70	Kailua, N. Kona
Ficus benghalensis (Indian banyan) ....	44-2	80	231	Lahaina
Ficus retusa (Chinese banyan) .....	90-1	104	195	Keaau, Puna
Macadamia tetraphylla .....	2-9	50	36	Kainaliu, N. Kona
Mangifera indica (mango) .....	24-8	71	70	Rainbow Falls, Hilo
Plumeria rubra (frangipani) .....	4-10	35	38	Arboretum, Hilo
Prosopis pallida (kiawe) .....	13-5	91	81	Puako, S. Kohala
Roystonea regia (royalpalm) .....	7-0	70	30	Honokea, Hawaii

<sup>1</sup> Circumference measured above bulge.

Source: L.W. Bryan, "Champion Trees of Hawaii," *American Forests*, May 1974.

**Table 342.—FISHERY OPERATING UNITS AND LANDINGS: 1958 TO 1976**

Year	Fishermen <sup>1</sup>			Motor vessels <sup>2</sup>		Boats <sup>2</sup>		Fishery establishments <sup>3</sup>	Landings <sup>4</sup>	
	Total	On vessels <sup>2</sup>	On boats and shore <sup>2</sup>	Number	Gross tonnage	Motor	Other		Quantity (1,000 lb.)	Value (\$1,000)
1958 <sup>5</sup> .....	....	....	....	....	....	....	....	....	11,361	2,632
1959 .....	688	343	345	64	1,066	224	39	....	16,570	3,179
1960 .....	598	330	268	63	1,775	193	9	22	11,118	2,704
1961 .....	589	320	269	65	1,908	195	20	20	14,472	2,897
1962 .....	817	273	544	60	1,745	318	35	19	13,157	2,820
1963 .....	820	266	554	56	1,728	360	23	16	11,735	2,679
1964 .....	743	233	510	57	1,722	350	24	17	12,685	2,848
1965 .....	744	264	480	57	1,762	324	23	24	19,588	3,602
1966 .....	744	271	473	65	1,852	312	11	26	13,014	3,128
1967 .....	677	237	440	61	1,811	305	17	29	11,842	3,077
1968 .....	1,032	292	740	63	1,844	466	14	32	12,896	3,451
1969 .....	1,338	315	1,023	61	1,923	599	32	36	9,543	3,483
1970 .....	1,436	333	1,103	80	2,278	637	49	37	11,051	3,900
1971 .....	1,533	355	1,178	89	2,475	773	39	44	16,873	5,238
1972 .....	1,732	396	1,336	101	2,769	828	11	40	14,443	5,743
1973 .....	2,091	357	1,734	104	2,801	1,095	2	41	14,035	6,115
1974 <sup>6</sup> .....	1,992	....	....	97	....	1,066	....	42	10,990	6,028
1975 .....	2,197	....	....	109	....	1,278	....	42	9,208	6,312
1976 .....	2,367	....	....	101	....	1,336	....	44	14,761	8,879

<sup>1</sup> Persons licensed as commercial fishermen by the Hawaii State Department of Land and Natural Resources, Fish and Game Division. Data refer to June 30 of the following year.

<sup>2</sup> A vessel is defined as a craft having a capacity of five net tons or over; a boat, as a craft having a capacity of less than five net tons. Data on vessels and boats refer to June 30 of the following year.

<sup>3</sup> Data include all fishery wholesaling and processing establishments in the State. All totals are as of June 30 of the year indicated.

<sup>4</sup> Data may differ from corresponding totals reported by the State Fish and Game Division, which, unlike the NMFS series shown here, include unsold fish.

<sup>5</sup> Fishery operating units not reported by NMFS before 1959.

<sup>6</sup> Methods of collecting data on operating units were changed in 1974.

Source: U.S. Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, *Fishery Statistics of the United States* (annual through 1967); U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, *Fishery Statistics of the United States* (annual, 1968-1974), and records.

**Table 343.—COMMERCIAL FISHING: 1968 TO 1978**  
 [Years ended June 30.]

Year	Fishermen licensed during year	Commercial fish landings				
		Pounds	Value (dollars)	Value per pound (dollars)	Per fisherman	
					Pounds	Value (dollars)
1968 .....	760	12,829,326	3,253,622	0.254	16,881	4,281
1969 .....	1,028	11,096,116	3,378,553	0.304	10,794	3,287
1970 .....	1,264	9,786,726	3,584,936	0.366	7,743	2,836
1971 .....	1,373	15,176,525	4,633,877	0.305	11,054	3,375
1972 .....	1,544	15,577,302	5,536,385	0.355	10,089	3,586
1973 .....	1,677	14,029,491	5,676,780	0.405	8,366	3,385
1974 .....	2,085	13,997,435	6,234,933	0.445	6,713	2,990
1975 .....	1,991	10,801,380	6,242,572	0.578	5,425	3,135
1976 .....	2,283	11,891,275	7,503,964	0.631	5,209	3,287
1977 .....	2,367	15,298,457	9,433,770	0.617	6,463	3,986
1978 .....	2,574	13,681,344	11,169,917	0.816	5,315	4,340

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

**Table 344.—COMMERCIAL FISH LANDINGS, BY SPECIES AND ISLAND:  
JULY 1, 1976 TO JUNE 30, 1977**

Island and species	Pounds caught	Value (dollars)
Total landings .....	15,298,457	9,433,770
ISLAND		
Hawaii .....	2,500,428	1,965,749
Maui .....	1,344,050	523,801
Lanai .....	26,907	14,509
Molokai .....	25,528	23,526
Oahu .....	11,040,190	6,681,802
Kauai .....	361,354	224,383
SPECIES <sup>1</sup>		
Sea catch, total <sup>2</sup> .....	15,278,610	9,412,141
Aku (Skipjack) .....	9,439,146	3,898,341
Ahi (Yellowfin) .....	2,089,698	1,923,080
Akule .....	804,841	525,723
Ahi (Bigeye) .....	376,723	712,141
Opelu .....	332,852	276,430
Pacific Blue Marlin .....	309,220	88,943
Ono .....	202,154	165,128
Striped Marlin .....	172,687	109,261
Mahimahi .....	149,794	198,239
Opakapaka .....	116,898	162,657
Limu .....	100,495	61,766
Ulua .....	95,046	76,885
Kawakawa .....	91,638	23,426
Hahalalu .....	87,197	65,583
Ulaula koe (Onaga) .....	85,843	197,466
Hapuupuu .....	58,840	72,338
Ahipalaha (Albacore) .....	51,775	34,329
Ula (Lobster) .....	48,422	83,876
Pond catch, total .....	19,847	21,629

<sup>1</sup> Shown separately for all species over 50,000 pounds or \$75,000.

<sup>2</sup> Includes species not shown separately.

Source: Hawaii State Department of Land and Natural Resources, Division of Fish and Game, *Commercial Fish Landings for Fiscal Year — July, 1976 through June, 1977* (October 1977).

**Table 345.—COMMERCIAL LIMU HARVEST: 1970 TO 1976**

[This series was discontinued in mid-1977]

Calendar year	Pounds taken	Pounds sold	Value (dollars)
1970 .....	49,427	49,302	16,166
1971 .....	88,813	88,813	28,366
1972 .....	96,563	96,460	34,838
1973 .....	97,140	96,987	35,909
1974 .....	46,366	45,885	23,899
1975 .....	64,502	63,587	39,207
1976 .....	65,716	64,446	39,632

Source: Hawaii State Department of Land and Natural Resources, Division of Fish and Game, records.

**Table 346.—MINERAL OPERATIONS: 1963 TO 1972**

Kind of operation and year	Establishments		All employees		Production, development, and exploration workers			Value added in mining (\$1,000)	Cost of supplies, etc. <sup>1</sup> (\$1,000)	Value of shipments and receipts <sup>2</sup> (\$1,000)	Capital expenditures <sup>3</sup> (\$1,000)
	Total	With 20 employees or more	Number	Payroll (\$1,000)	Number	Man-hours (\$1,000)	Wages (\$1,000)				
<b>MINERAL INDUSTRIES ONLY</b>											
1963 .....	44	4	315	1,658	228	560	1,451	4,909	2,136	6,525	520
1967 <sup>4</sup> .....	12	3	200	1,600	200	400	1,300	5,000	2,300	5,500	1,800
1972 <sup>4</sup> .....	15	5	300	2,400	200	400	1,800	9,000	4,100	11,000	2,000
<b>INCLUDING OPERATIONS IN MANUFACTURES</b>											
1963 .....	49	4	339	1,758	312	607	1,551	5,677	1,985	7,462	520
1967 .....	18	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
1972 .....	21	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

D Withheld to avoid disclosing figures for individual companies.

<sup>1</sup> Data for mineral industries only include purchase machinery installed. Data including mineral operations in manufacturing establishments exclude purchase machinery installed.<sup>2</sup> For crushed and broken stone, sand and gravel mining operations in manufacturing establishments, includes the estimated value of minerals produced and used in the same establishment in making manufactured products.<sup>3</sup> Excludes data for crushed and broken stone, sand and gravel mining operations in manufacturing establishments.<sup>4</sup> Excludes data for companies without paid employees. In 1963, there were 16 single-unit establishments without paid employees in Hawaii; these establishments accounted for approximately 3 percent of value added.Source: U.S. Bureau of the Census, *U.S. Census of Mineral Industries* for 1963 (MIC63(2)-10, table 1; 1967, MIC67(2)-10, table 1; and 1972, MIC72(2)-9, table 1.



**Table 347.—MINERAL PRODUCTION: 1970 TO 1977**

[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 <sup>1</sup>
1970 .....	406	6,331	28,965	10,334	15,538	3,093
1971 .....	386	6,056	28,107	10,627	14,357	3,123
1972 .....	415	5,005	28,074	11,116	13,494	3,464
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 <sup>2</sup> .....	346	5,855	43,750	19,936	21,357	2,457

<sup>1</sup> Chiefly sand and gravel; pumice, pumicite, and volcanic cinder; and lime.<sup>2</sup> Preliminary.Source: U.S. Bureau of Mines, *Minerals Yearbook* (annual) and "The Mineral Industry in Hawaii," *Mineral Industry Surveys* (annual preliminary and advance summary reports).