

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 938,000 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 1976. Primary forest products harvested in 1969 (the most recent year available) had a value of \$331,000. Sixty-four forest and brushland fires burned 6,881 acres in 1976. According to a 1974 compilation, the tallest tree in the State is a 203-foot eucalyptus saligna.

The commercial fish catch in fiscal 1976 was 11.9 million pounds and had a value of \$7.5 million. *Aku* (Skipjack) accounted for 39 percent of the total value. Other important species were *ahi*, *akule*, *opelu*, and *opakapaka*. Commercial fishermen numbered 1,992; they operated 1,163 fishing vessels, serving 28 fishery wholesaling and processing establishments.

The value of mineral production reached \$42.6 million in 1976, 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 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: 1976*, Sections 24, 25, and 26.

**Table 300.—FOREST RESERVE, TREES PLANTED, AND FOREST FIRES:
1966 TO 1976**

| Year | Forest reserve ¹ (1,000 acres) | Acres planted in trees ² | Forest and brushland fires ³ | |
|------------|--|-------------------------------------|---|--------------|
| | | | Number | Acres burned |
| 1966 | 1,196 | 2,553 | 37 | 2,120 |
| 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 |

¹ 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.

² Years ended June 30. Data refer to acreage planted in forest reserves.

³ Calendar years.

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

**Table 301.—AREA OF FOREST LAND, 1970, AND PLANTED FOREST, 1976, BY ISLAND
(In acres)**

| Island | Forest land, 1970 | | Area of planted forest, to 1976 ³ |
|-------------------|--------------------|-------------------------|--|
| | Total ¹ | Commercial ² | |
| State total | 1,986,400 | 938,300 | 49,289 |
| Niihau | 31,100 | — | — |
| Kauai | 219,900 | 145,300 | 5,280 |
| Oahu | 205,300 | 124,400 | 7,198 |
| Molokai | 78,100 | 33,500 | 2,847 |
| Lanai | 43,900 | 4,500 | 512 |
| Kahoolawe | 15,800 | — | — |
| Maui | 239,800 | 63,400 | 10,670 |
| Hawaii | 1,152,500 | 567,200 | 22,782 |

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

² Includes Federal military (12,300), State (428,100), miscellaneous corporate (294,900), and miscellaneous individual (203,000).

³ 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 302.—PRIMARY FOREST PRODUCTS HARVESTED: 1958 TO 1969

| Subject | Total | Sawlogs | Craftwood | Veneer logs | Fuelwood | Posts | Treefern |
|---------------------------------|-------|---------|-----------|-------------|----------|-------|----------|
| Production:¹ | | | | | | | |
| 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 |
| Average unit value (\$): | | | | | | | |
| 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 |
| Total value (\$1,000): | | | | | | | |
| 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 |

¹ 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 303.—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) ¹ | 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 |

¹ Circumference measured above bulge.

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

Table 304.—FISHERY OPERATING UNITS AND LANDINGS: 1958 TO 1975

| Year | Fishermen ¹ | | | Motor vessels ² | | Boats ² | | Fishery establishments ³ | Landings ⁴ | |
|-------------------------|------------------------|-------------------------|---------------------------------|----------------------------|---------------|--------------------|-------|-------------------------------------|-----------------------|-----------------|
| | Total | On vessels ² | On boats and shore ² | Number | Gross tonnage | Motor | Other | | Quantity (1,000 lb.) | Value (\$1,000) |
| 1958 ⁵ | | | | | | | | ... | 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 ⁶ | 1,992 | ... | ... | 97 | ... | 1,066 | | 28 | 10,991 | 6,029 |
| 1975 | 2,197 | ... | ... | 109 | ... | 1,278 | | 28 | 9,208 | 6,312 |

¹ 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.

² 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.

³ Data through 1972 include all fishery wholesaling and processing establishments in the State. Data for later years include only processing plants. All totals are as of June 30 of the year indicated.

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

⁵ Fishery operating units not reported by NMFS before 1959.

⁶ 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, 1968-1973), and records.

Table 305.—COMMERCIAL FISHING: 1966 TO 1976

| Years ended June 30 | Fishing boats | Fisher- men | Commercial fish landings | |
|------------------------|------------------|----------------|--------------------------|--------------------|
| | | | Pounds | Value (dollars) |
| 1966 | 365 | 715 | 15,987,978 | 3,319,917 |
| 1967 | 397 | 801 | 12,354,658 | 3,147,566 |
| 1968 | 387 | 760 | 12,829,326 | 3,253,622 |
| 1969 | 509 | 1,028 | 11,096,116 | 3,378,553 |
| 1970 | 670 | 1,264 | 9,786,726 | 3,584,936 |
| 1971 | 738 | 1,373 | 15,176,525 | 4,633,877 |
| 1972 | (NA) | 1,544 | 15,577,302 | 5,536,385 |
| 1973 | (NA) | 1,857 | 14,029,491 | 5,676,780 |
| 1974 | (NA) | 2,051 | 13,997,435 | 6,234,933 |
| 1975 | (NA) | 1,931 | 10,801,380 | 6,242,572 |
| 1976 | (NA) | 2,183 | 11,891,275 | 7,503,964 |

NA Not available.

Source: Hawaii State Department of Land and Natural Resources, Division of Fish and Game, *Commercial Fish Landings* (semi-annual and annual report), and records.

**Table 306.—COMMERCIAL FISH LANDINGS, BY SPECIES AND ISLAND:
YEAR ENDED JUNE 30, 1976**

| Island and species | Pounds caught | Value (dollars) |
|-------------------------------------|---------------|-----------------|
| Total landings | 11,891,275 | 7,503,964 |
| ISLAND | | |
| Hawaii | 2,361,850 | 1,754,979 |
| Maui | 750,414 | 277,209 |
| Lanai | 6,990 | 3,178 |
| Molokai | 35,761 | 27,175 |
| Oahu | 8,388,893 | 5,255,543 |
| Kauai | 347,367 | 185,880 |
| SPECIES ¹ | | |
| Sea catch, total ² | 11,871,076 | 7,486,272 |
| Aku (Skipjack) | 6,891,039 | 2,911,061 |
| Ahi (Yellowfin) | 1,723,128 | 1,463,376 |
| Akule | 746,857 | 442,211 |
| Ahi (Bigeye) | 425,537 | 845,188 |
| Opelu | 291,337 | 231,236 |
| Striped Marlin | 230,412 | 113,243 |
| Opakapaka | 147,505 | 165,195 |
| Ono | 132,105 | 90,448 |
| Mahimahi | 119,332 | 145,010 |
| Ahipalaha (Albacore) | 104,942 | 93,311 |
| Ulua | 93,771 | 74,542 |
| Ulaula Koa (Onaga) | 80,543 | 162,219 |
| Pacific Blue Marlin | 73,582 | 22,108 |
| Uku | 69,832 | 68,321 |
| Kawakawa | 66,669 | 18,215 |
| Limu | 62,211 | 36,873 |
| Hapuupuu | 57,478 | 66,920 |
| Kahala | 40,434 | 21,822 |
| Weke | 37,086 | 21,673 |
| Ulaula (Ehu) | 34,310 | 58,411 |
| Crab (Kona) | 26,577 | 55,900 |
| Pond catch, total | 20,199 | 17,692 |

¹ Shown separately for all species over 35,000 pounds or \$50,000.

² 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, 1975 through June, 1976* (October 1976).

Table 307.—COMMERCIAL LIMU HARVEST: 1970 TO 1976

| 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 308.—MINERAL OPERATIONS: 1963 TO 1972

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

¹ Data for mineral industries only include purchase machinery installed. Data including mineral operations in manufacturing establishments exclude purchase machinery installed.

² 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.

³ Excludes data for crushed and broken stone, sand and gravel mining operations in manufacturing establishments.

⁴ 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 309.—MINERAL PRODUCTION: 1970 TO 1976

(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 ¹ |
| 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 | 501 | 7,638 | 42,042 | 17,111 | 21,370 | 3,561 |
| 1975 | 469 | 7,569 | 49,710 | 20,704 | 25,319 | 3,687 |
| 1976 ² | 339 | 6,965 | 42,630 | 15,919 | 22,807 | 3,904 |

¹ Chiefly sand and gravel; pumice, pumicite, and volcanic cinder; and lime.² 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).