

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-1982. Forest products harvested in 1977 had a value of \$3.5 million, including \$2.3 million from logs for fiber. More than 250 forest and brushland fires burned 6,900 acres in fiscal 1982.

The commercial fish catch in fiscal year 1981 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 2,525; they operated some 1,300 fishing vessels, serving about 126 fishery wholesaling and processing establishments.

The value of mineral production reached \$44 million in 1982, most of it in cement (\$16 million) and stone (\$24 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: 1982-83, Sections 25, 26 and 27.

Table 510.-- FOREST ACREAGE, BY ISLANDS: 1970-1982

| Island | Forest and water reserve, 1982 ^{1/} (acres) | Forest land, 1970 (acres) | | | Planted forest, June 30, 1982 (acres) | |
|--------------------|--|---------------------------|---------------------------|------------------------------|---------------------------------------|----------------|
| | | Total | Com-mercial ^{2/} | Noncom-mercial ^{3/} | Planted in preceding year | Total standing |
| State total . | 1,186,462 | 1,986,400 | 947,800 | 1,038,600 | 234 | 46,220 |
| Hawaii | 697,361 | 1,152,500 | 569,400 | 583,100 | 105 | 17,806 |
| Maui | 155,247 | 239,800 | 67,500 | 172,300 | 70 | 11,516 |
| 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 | 59 | 6,145 |
| Niihau | - | 31,100 | - | 31,100 | - | - |
| Other islands | - | - | - | - | - | - |

^{1/} Forest and water reserve within conservation district, as of June 30.

^{2/} Includes federal military, state, miscellaneous corporate, and miscellaneous individual forest land.

^{3/} Unproductive or productive-reserved.

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

Table 511.-- 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 data cited in Statistical Abstract of the United States: 1982-83, p. 695.

Table 512.-- FOREST AND BRUSHLAND FIRES: 1981 AND 1982
[Years ended June 30.]

| County | Number of fires | | Acres burned | |
|-------------------|-----------------|------|--------------|-------|
| | 1981 | 1982 | 1981 | 1982 |
| State total | 508 | 255 | 15,152 | 6,919 |
| Hawaii | 246 | 104 | 3,823 | 2,155 |
| Maui | 120 | 94 | 9,284 | 4,461 |
| Honolulu | 117 | 46 | 1,924 | 260 |
| Kauai | 25 | 11 | 122 | 43 |

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

Table 513.-- FOREST PRODUCTS HARVESTED: 1977

| Forest product | Output | | Unit price (dollars) | Total value (dollars) |
|----------------------------|--------------------------|--------|-------------------------|--------------------------|
| | Unit | Amount | | |
| All products | ... | ... | ... | 3,465,233 |
| Logs for lumber | MBF ¹ | 2,750 | 209 | 574,833 |
| Logs for craftwood | Cords ² / .. | 299 | 224 | 51,330 |
| Logs for fiber | BDT ³ / | 55,502 | 41 | 2,310,500 |
| Tree fern | Cubic feet | 95,000 | 1.42 | 135,000 |
| Fuelwood from trees | Cords ² / .. | 4,191 | 47 | 194,563 |
| Fuelwood for charcoal | Cords ² / .. | 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 ² / .. | 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 514.-- FISHERY OPERATING UNITS AND LANDINGS: 1972 TO 1982

| Year | 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) |
| 1972 ... | 1,732 | 101 | 839 | 123 | 14,443 | 5,743 |
| 1973 ... | 2,091 | 104 | 1,097 | 125 | 14,035 | 6,115 |
| 1974 <u>5/</u> | 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 |

NA Not available.

1/ Persons licensed as commercial fishermen by the Hawaii State Department of Land and Natural Resources.

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 State Fish and Game Division, which, unlike the NMFS series shown here, include unsold fish.

5/ Methods of collecting data on operating units were changed in 1974.

Source: U.S. Department of Commerce, National Marine Fisheries Service, Fishery Statistics of the United States (annual, 1971-1975), and information provided August 4, 1981, June 30, 1982, and September 15, 1983.

Table 515.-- COMMERCIAL FISHING: 1962 TO 1982

[Years ended June 30.]

| Year | Number of commercial fishers | Commercial fish catch ^{1/} | | |
|----------------------|------------------------------|-------------------------------------|-------------|--------------------------------------|
| | | 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/} . | 2,447 | 12,310,524 | 11,890,241 | 12,673,328 |
| 1980 ^{2/} . | 2,525 | 10,418,964 | 9,946,065 | 10,497,456 |
| 1981 ^{2/} . | 2,577 | 10,890,468 | 10,465,731 | 11,828,575 |
| 1982 ^{2/} . | 2,525 | 9,178,789 | 8,824,348 | 10,754,276 |

^{1/} Represents the total catches of all licensed commercial fishers. Includes both sea and pond catch, but excludes coral harvests.

^{2/} 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 516.-- COMMERCIAL FISH CATCH, BY SPECIES: 1982

[Year ended June 30, 1982.]

| Species <u>1/</u> | Pounds caught | Pounds sold | Value (dollars) |
|--|---------------|-------------|-----------------|
| Total catch | 9,178,789 | 8,824,348 | 10,754,276 |
| Sea catch, all species <u>2/</u> | 9,161,848 | 8,807,639 | 10,725,960 |
| Aku (Skipjack) | 3,513,560 | 3,484,216 | 2,863,710 |
| Ahi (Yellowfin) | 2,536,512 | 2,452,043 | 3,248,131 |
| Pacific Blue Marlin | 476,161 | 416,860 | 244,518 |
| Akule | 358,941 | 326,809 | 425,495 |
| Opelu | 262,064 | 256,590 | 356,856 |
| Ono | 256,895 | 236,303 | 508,565 |
| Mahimahi | 225,179 | 208,763 | 558,201 |
| Ahipalaha (Albacore) | 192,332 | 191,862 | 152,512 |
| Opakapaka | 184,272 | 176,785 | 528,572 |
| Uku | 92,854 | 89,478 | 211,499 |
| Ulua | 87,731 | 82,010 | 124,091 |
| Onaga | 66,063 | 63,708 | 221,107 |
| Ahi (Bigeye) | 46,695 | 45,467 | 131,648 |
| Lobster | 20,659 | 20,253 | 120,608 |
| Pond catch, all species | 16,941 | 16,709 | 28,316 |

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

2/ Including species not shown separately.

Source follows next table.

Table 517.-- COMMERCIAL FISH LANDINGS, BY ISLANDS: 1982

[Year ended June 30.]

| Island | Pounds caught | Pounds sold | Value (dollars) |
|-------------------|---------------|-------------|-----------------|
| State total | 9,178,789 | 8,824,348 | 10,754,276 |
| Hawaii | 3,223,524 | 3,138,057 | 4,146,696 |
| Maui | 725,285 | 679,010 | 797,657 |
| Lanai | 15,853 | 15,090 | 18,030 |
| Molokai | 51,366 | 40,158 | 57,564 |
| Oahu | 4,681,480 | 4,547,769 | 5,149,433 |
| Kauai | 481,281 | 404,264 | 584,896 |

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, Commercial Fish Landings for Fiscal Year -- July, 1981 through June, 1982.

Table 518.-- FISH SURVEYS AT SPECIFIED SITES: 1981-1982

[Biomass in pounds per acre.]

| Location | Date | Species | Individuals | Biomass |
|---------------------------------|---------------|---------|-------------|---------|
| Hanauma Bay, Oahu: | | | | |
| Inshore stations | Jan. 14, 1982 | 62 | 1,523 | 3,756 |
| Offshore stations | June 23, 1982 | 48 | 707 | 188 |
| Waikiki-Diamond Head area, Oahu | 1981-1982 | 122 | (NA) | 140 |
| Waianae artificial reef, Oahu: | | | | |
| Car-body/concrete pipes | June 30, 1982 | 41 | 278 | 45 |
| "Doughnut" | June 30, 1982 | 46 | 386 | 280 |
| Maunaloa Bay, Oahu | June 24, 1982 | 72 | 1,486 | 381 |
| Honolua-Mokuleia Bay, Maui | June 16, 1982 | 70 | 1,593 | 260 |
| Ahihi-Kinau, Maui | Nov. 20, 1981 | 23 | 221 | 562 |
| Olowalu, Maui | Feb. 26, 1982 | 39 | 309 | 225 |
| SE of Hekili Point, Maui | Dec. 2, 1981 | 15 | 164 | 409 |
| Maalaea Harbor, Maui | Dec. 15, 1981 | 22 | 154 | 60 |
| Puu O'lae, Maui | Feb. 19, 1983 | 34 | 274 | 172 |
| Molokini Shoals, Maui | Mar. 18, 1982 | 87 | 4,794 | 461 |
| Manele-Hulopoe, Lanai | Mar. 17, 1982 | 96 | 4,781 | 371 |
| Kealakekua Bay, Hawaii | Mar. 29, 1982 | 104 | 7,978 | 429 |
| Lapakahi, Hawaii | Mar. 30, 1982 | 93 | 6,788 | 464 |
| Honaunau Bay, Hawaii | Mar. 30, 1982 | 70 | 3,119 | 312 |
| Waialea Bay, Hawaii | Apr. 1, 1982 | 71 | 2,007 | 280 |

NA Not available.

Source follows next table.

Table 519.--MOST ABUNDANT FISH SPECIES AT HANAUMA BAY AND THE
 WAIKIKI-DIAMOND HEAD AREA: 1981-1982

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

| Location and species | Number per acre | | Pounds per acre | |
|-----------------------------------|-----------------|--------|-----------------|--------|
| | Rank | Number | Rank | Pounds |
| Hanauma Bay: <u>1/</u> | | | | |
| Manini | 1 | 973 | 4 | 203 |
| Maiko (Acanthurus nigrofuscus) .. | 2 | 276 | 9 | 86 |
| Nenu | 3 | 262 | 2 | 521 |
| Hinalea lau-wili | 4 | 254 | 23 | 26 |
| 'Ama'ama | 5 | 208 | 3 | 340 |
| Pualu (Acanthurus xanthopterus) . | 7 | 198 | 1 | 1,059 |
| Pualu (Acanthurus mata) | 18 | 57 | 5 | 181 |
| Waikiki-Diamond Head: <u>2/</u> | | | | |
| Manini | 1 | 168 | 1 | 35 |
| Hinalea lau-wili | 2 | 156 | 4 | 12 |
| Omaka | 3 | 104 | 8 | 4 |
| Maiko (Acanthurus nigrofuscus) .. | 4 | 104 | 3 | 22 |
| Yellow-eye damselfish | 5 | 73 | 7 | 4 |
| Kala | 6 | 33 | 2 | 24 |
| Weke | 8 | 18 | 5 | 6 |

1/ Inshore stations 3-A and 3-B (eastern and western portions inshore of surf zone) of Hanauma Bay Marine Life Conservation District, Oahu, surveyed January 14, 1982.

2/ For four stations within the Waikiki-Diamond Head Shoreline Fisheries Management Area, Oahu, surveyed monthly between July 1981 and June 1982.

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, Job Progress Report, Survey of Fish and Habitat, July 1, 1981 to June 30, 1982.

Table 520.-- MINERAL INDUSTRIES: 1958 TO 1977

| Subject | 1958 | 1963 | 1967 | 1972 | 1977 |
|--|------|------|------|------|------|
| Including mines at manufactures | | | | | |
| Number of establishments | 24 | 49 | 18 | 21 | 10 |
| With 20 employees or more | 8 | 4 | 5 | 5 | 3 |
| Value added in mining (million dollars) | 4.9 | 5.7 | (D) | (D) | (D) |
| Excluding mines at manufactures | | | | | |
| Number of establishments <u>1/</u> | 20 | 44 | 12 | 15 | 7 |
| With 20 employees or more | 8 | 4 | 3 | 5 | 2 |
| All employees: <u>2/</u> | | | | | |
| Number (1,000) | .4 | .3 | .2 | .3 | .1 |
| Payroll (million dollars) | 1.7 | 1.7 | 1.6 | 2.4 | 1.9 |
| Production, development, and exploration workers: | | | | | |
| Number <u>2/</u> (1,000) | .4 | .2 | .2 | .2 | .1 |
| Hours (millions) | .7 | .6 | .4 | .4 | .2 |
| Wages <u>2/</u> (million dollars) | 1.4 | 1.5 | 1.3 | 1.8 | 1.5 |
| Value added in mining (million dollars) | 4.6 | 4.9 | 5.0 | 9.0 | 8.1 |
| Cost of supplies used, purchased machinery installed, etc. (million dollars) | 2.0 | 2.1 | 2.3 | 4.1 | 2.9 |
| Value of shipments and receipts <u>3/</u> (million dollars) | 5.8 | 6.5 | 5.5 | 11.0 | 9.7 |
| Capital expenditures (million dollars) | .7 | .5 | 1.8 | 2.0 | 1.3 |

Footnotes and source on next page.

Table 520.-- MINERAL INDUSTRIES : 1958 TO 1977 - Con.

(D) Withheld to avoid disclosing operations of individual companies.

1/ In 1977, 1972, and 1967, data for companies without paid employees were excluded from the census of mineral industries.

2/ For crushed and broken stone, sand and gravel, clay, and gypsum mining operations in manufacturing establishments, the number of production, development, and exploration workers was estimated from reported figures for hours worked. No data were obtained on other employees at such operations; hence, the same employment and payroll figures are included for all employees as for production, development, and exploration workers.

3/ For crushed and broken stone, sand and gravel, clay, and gypsum, mining operations in manufacturing establishments, includes the estimated value of minerals produced and used in the same establishment in making manufactured products. For all years, represents gross value of shipments and contains some duplication due to the transfer of crude minerals from one establishment to another for preparation.

Source: U.S. Bureau of the Census, 1977 Census of Mineral Industries, Geographic Area Series, Pacific Division, MIC77-A-9 (March 1981), table 1.

Table 521.-- NONFUEL MINERAL PRODUCTION SUMMARY: 1972 TO 1982

[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 |
| 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 | 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 <u>1/</u> .. | 312 | 6,036 | 58,727 | 23,831 | 31,407 | 3,489 |
| 1982 <u>2/</u> .. | 205 | 4,100 | 43,995 | 15,900 | 24,204 | 3,891 |

1/ Revised from Data Book 1982, table 470.

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 522.-- NONFUEL MINERAL PRODUCTION: 1981 AND 1982

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

| Mineral | Quantity (1,000 short tons) | | Value (\$1,000) | |
|-----------------------|-----------------------------|----------------|-----------------|----------------|
| | 1981 <u>1/</u> | 1982 <u>2/</u> | 1981 <u>1/</u> | 1982 <u>2/</u> |
| Total | (X) | (X) | 58,727 | 43,995 |
| Cement: | | | | |
| Portland | 302 | 200 | 23,024 | 15,500 |
| Masonry | 10 | 5 | 807 | 400 |
| Sand and gravel | 1,100 | 940 | 2,900 | 3,000 |
| Stone: | | | | |
| Crushed | 6,036 | 4,100 | 31,403 | 24,200 |
| Dimension | (Z) | (Z) | 4 | 4 |
| Other nonmetals | (X) | (X) | 589 | 891 |

X Not applicable.

Z Less than 500 short tons.

1/ Revised from Data Book 1982, table 471.

2/ Preliminary.

Source: U.S. Bureau of Mines, "The Mineral Industry of Hawaii in 1982," Mineral Industry Surveys (January 17, 1983).