

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 700,000 acres of timberland in the State, most of it on the Big Island. Over 45,000 acres had been planted in eucalyptus and other species of trees by mid-1989. Recent surveys of vegetation on three islands show ohia lehua to be the most common type of tree on Oahu and Kauai (with acreages of 38,000 and 109,000, respectively) and kiawe the leading type (at 33,000 acres) on Molokai. Forest and brushland fires burned 10 square miles in fiscal 1989.

The commercial fish catch in fiscal year 1989 amounted to 13.5 million pounds, with a value of \$28 million to primary producers. Ahi (yellowfin) and aku (skipjack) accounted for 35 percent of the total value. Other important species are spiny lobster, opakapaka, mahimahi, and ono. Commercial fishermen numbered 3,491. Among Marine Life Conservation Districts, those with the most fish per acre were Honolua-Mokuleia Bays (8,253), Molokini Shoal (2,711), and Hanauma Bay (2,532 offshore).

The value of mineral production reached \$93 million in 1989, almost all of it in cement (\$41 million) and crushed stone (\$48 million). The 1989 total was an all-time high.

Important sources of data on these subjects are the United States Census of Mineral Industries and reports and records of the U.S. Bureau of Mines 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: 1990, Sections 24 and 25.

Table 591.-- FOREST ACREAGE, BY ISLANDS: 1989

Island	Conservation district forest land, June 30, 1989		Planted forest, June 30, 1989	
	Forest reserve land <u>1/</u>	Private forest land <u>2/</u>	Planted in preceding year	Total standing
State total	840,540	327,845	108	45,498
Hawaii	585,000	106,745	62	16,851
Maui	93,320	53,180	7	11,689
Kahoolawe	-	-	-	-
Lanai	-	6,150	-	512
Molokai	44,290	-	12	3,217
Oahu	29,810	87,920	-	7,039
Kauai	88,120	73,850	27	6,190
Niihau	-	-	-	-

1/ State owned and privately owned lands under surrender agreement in forest reserve system.

2/ Private forest land within conservation district. The majority of these lands were previously in the forest reserve system.

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

Table 592.-- WOODLAND ON FARMS, 1978 TO 1987, AND BY COUNTIES, 1987

[Acres]

Use	1978	1982	1987				
			State total	Hawaii	Maui	Hono-lulu	Kauai
Total	145,802	117,270	99,135	75,331	14,024	7,085	2,695
Pastured	40,242	36,550	27,517	22,973	992	2,797	755
Not pastured ..	105,560	80,720	71,618	52,358	13,032	4,288	1,940

Source: U.S. Bureau of the Census, 1987 Census of Agriculture, Hawaii AC87-A-11 (August 1989), pp. 15 and 36.

Table 593.-- LAND AREA, BY VEGETATION TYPE AND FOREST RESERVE STATUS, FOR MOLOKAI, OAHU, AND KAUAI: 1986

[In acres. Excludes land in forest plantations]

Vegetation type	Molokai		Oahu		Kauai	
	Total	Forest reserve	Total	Forest reserve	Total	Forest reserve
Total, all types	163,214	44,288	370,002	34,931	347,088	88,127
Tree type:						
Ohia lehua	32,833	30,161	37,563	9,524	109,040	50,702
Koa	-	-	28,548	6,601	13,438	6,223
Kukui	4,773	4,009	2,775	617	7,634	2,029
Kiawe	33,215	-	17,354	241	10,358	116
Eucalyptus	1,527	954	1,131	411	3,157	1,288
Guava	5,918	4,200	10,287	1,421	12,143	3,099
Other trees	2,673	573	36,700	6,776	32,763	6,043
Shrub type	16,417	1,527	33,974	2,965	36,061	7,189
Forb type	191	-	11,338	2,718	4,120	2,043
Grassland	38,751	764	45,102	3,261	34,168	5,198
Cultivated land	18,325	-	55,770	-	64,741	387
No vegetation	3,819	-	822	-	6,709	3,810
Urban and other	4,772	2,100	88,638	396	12,756	-

Source: Hawaii State Department of Land and Natural Resources, Division of Forestry and Wildlife, multi-resource inventory reports.

Table 594.-- FOREST LAND, TIMBERLAND AREA, VOLUME OF SAWTIMBER,
AND GROWING STOCK: JANUARY 1, 1987

Subject	1,000 acres	Subject	Amount
Total forest land	1,748	Sawtimber, net volume:	
		Total (mil. bd. ft.)	1,196
Timberland	700	Softwood (mil. bd. ft.)	18
Federal	-		
State or county	338	Growing stock, net volume:	
Private	362	Total (mil. cu. ft.)	280
		Softwood (mil. cu. ft.)	4

Source: U.S. Forest Service, cited in Statistical Abstract of the United States: 1990, p. 672.

Table 595.-- FOREST AND BRUSSLAND FIRES, 1987 TO 1989, AND BY
COUNTIES, 1989

[Years ended June 30]

Subject	1987	1988	1989, by counties				
			State total	Hawaii	Maui	Hono- lulu	Kauai
Number of fires ...	109	79	82	25	28	22	7
Acres burned	6,713	34,794	6,585	5,167	1,259	12	147

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

Table 596.-- COMMERCIAL FISHING: 1970 TO 1989

[Years ended June 30]

Year	Number of commercial fishermen	Commercial fish catch <u>1/</u>		
		Pounds landed	Pounds sold	Value to primary producers (dollars)
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
1984	2,940	9,819,800	9,344,200	13,556,184
1985	2,638	9,436,591	9,077,357	15,901,656
1986	2,880	9,503,193	9,081,881	18,557,533
1987	3,008	12,128,527	11,628,387	20,477,699
1988	3,155	11,052,502	10,592,287	20,541,580
1989	3,491	13,493,866	13,010,973	28,003,055

1/ Represents the total catches of all licensed commercial fishers. Includes both sea and pond catches, but excludes coral harvests. Particularly for 1979-1988, data may be incomplete due to unreported aku (skipjack tuna) and longline 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 597.-- COMMERCIAL FISH CATCH, BY SPECIES: 1989

[Year ended June 30, 1989]

Species <u>1/</u>	Pounds caught	Pounds sold	Value (dollars)
Total catch	13,493,866	13,010,973	28,003,055
Sea catch, all species <u>2/</u>	13,467,823	12,984,966	27,944,835
Aku (Skipjack)	3,581,882	3,506,479	4,329,545
Ahi (Yellowfin tuna)	2,791,176	2,721,863	5,600,378
Ahi (Bigeye tuna)	959,945	948,738	3,157,612
Blue marlin	957,745	882,046	768,578
Striped marlin	578,523	568,125	606,695
Mahimahi	420,041	396,439	1,106,147
Akule	417,369	383,567	696,302
Ono	414,586	394,076	1,062,859
Opakapaka	382,325	371,679	1,341,065
Ula (spiny lobster)	354,572	334,709	3,496,221
Opelu	354,297	346,305	530,151
Uku	319,601	312,122	866,157
Ahipalaha	209,226	208,490	276,237
Swordfish	181,630	181,220	528,149
Ulaula	159,994	155,950	731,847
Shortbill spearfish	129,653	123,578	148,302
Ulua/papio	128,193	119,378	190,480
Ula papapa (slipper lobster)	62,746	55,945	514,745
Laevigatus (shrimp)	57,210	57,210	271,748
Pond landings, all species	26,043	26,007	58,220

1/ Shown separately for all species over 100,000 lb. or \$200,000.

2/ Including species not shown separately.

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, Commercial Fish Landings--Fiscal Year 1988-89.

Table 598.-- COMMERCIAL SEA LANDINGS, BY ISLANDS: 1989

[Year ended June 30, 1989]

Island	Pounds landed	Pounds sold	Value (dollars)
State total	13,467,823	12,984,966	27,944,835
Hawaii	3,175,529	3,080,678	5,484,922
Maui	618,844	530,980	1,207,083
Lanai	17,109	14,333	24,341
Molokai	62,047	51,307	132,279
Oahu	8,680,792	8,507,115	19,327,220
Kauai and Niihau	913,502	800,553	1,768,990

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, Commercial Fish Landings--Fiscal Year 1988-89.

Table 599.-- COMMERCIAL SEA LANDINGS, BY FISHING METHOD: 1989

[Year ended June 30, 1989]

Fishing method	Pounds landed	Pounds sold	Value (dollars)
All methods	13,467,823	12,984,966	27,944,835
Aku pole and line	3,289,052	3,288,886	3,995,302
Longline	2,861,043	2,845,120	6,548,540
Handline	3,451,807	3,348,894	7,684,718
Trolling	2,491,291	2,210,734	3,972,215
All other methods	1,374,630	1,291,332	5,744,060

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, Commercial Fish Landings--Fiscal Year 1988-89.

Table 600.-- FISH POPULATIONS AROUND SELECTED SHORELINE AREAS:
YEAR ENDED JUNE 30, 1989

Location	Species	Fish per acre	Pounds per acre
Marine Life Conservation Districts:			
Hanauma Bay, Oahu: Offshore	79	2,532	796
Molokini Shoal, Maui	112	2,711	851
Honolua-Mokuleia Bays, Maui	74	8,253	3,538
Manele-Hulopoe Bays, Lanai	97	2,488	668
Wailea Bay, Hawaii	82	1,715	445
Lapakahi, Hawaii	98	2,231	248
Kealakekua Bay, Hawaii	95	1,717	200
Waikiki, Oahu	(NA)	1,073	191
Artificial reefs:			
Maunalua Bay, Oahu: Tire modules .	(NA)	7,484	1,891
Keawakapu, Maui	(NA)	(NA)	31
Fisheries Management Areas:			
Waikiki-Diamond Head, Oahu	(NA)	1,045	534
Puako Reef, Hawaii (near shore) ...	40	1,739	156
Other areas:			
Barbers Point, Oahu.....	97	1,090	161
Makapuu, Oahu	(NA)	1,230	137
"Pine Trees" Hawaii.....	18	2,641	40
Poipu, Kauai	78	5,065	687
Salt Ponds, Kauai	83	2,516	344

NA Not available.
Source follows next table.

Table 601.--MOST ABUNDANT AND HEAVIEST FISH SPECIES AT SPECIFIED
LOCATIONS: YEAR ENDED JUNE 30, 1989

[Three leading species at each location, based on both individuals per acre
and pounds per acre]

Location and species	Individuals per acre		Pounds per acre	
	Rank	Number	Rank	Number
Waikiki-Diamond Head Shoreline Fisheries Management Area (closed to fishing period):				
<u>Acanthurus triostegus</u> (manini)	1	543	2	68
<u>Thalassoma duperrey</u> (hinalea lauwili)	2	520	3	40
<u>Acanthurus nigrofuscus</u> (lavender tang)	3	463	1	93
Hanauma Bay Marine Life Conservation District (offshore):				
<u>Abudefduf abdominalis</u> (mamo)	1	726	2	126
<u>Rhinecanthus rectangulus</u> (black-wedge humu) .	2	261	1	264
<u>Chaetodan miliaris</u> (milletseed butterfly) ...	3	156	4	57
<u>Mulloidis vanicolensis</u> (red weke)	6	131	3	99
Kealakekua Bay Marine Life Conservation District:				
<u>Zebrasoma flavescens</u> (pala or yellow tang) ..	1	337	2	35
<u>Ctenochaetus strigosus</u> (kole)	2	272	6	9
<u>Chromis leucurus</u> (dark damsel)	3	150	(NA)	(NA)
<u>Melichthys niger</u> (ele'ele)	4	113	1	44
<u>Scarus sordidus</u> (uhu)	(NA)	(NA)	3	25

NA Not available.

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, Statewide Marine Research and Surveys, Survey of Fish and Habitat, July 1, 1988 to June 30, 1989.

Table 602.-- MINERAL INDUSTRIES: 1958 TO 1987

[Excluding mines at manufactures]

Subject	1958	1963	1967	1972	1977	1982	1987
Number of establishments ^{1/}	20	44	12	15	7	12	9
With 20 employees or more	8	4	3	5	2	4	4
All employees:							
Number (1,000) .....	.4	.3	.2	.3	.1	.2	.2
Payroll (million dollars)	1.7	1.7	1.6	2.4	1.9	3.8	7.4
Production, development, and ex- ploration workers:							
Number (1,000) .....	.4	.2	.2	.2	.1	.1	.2
Hours (millions) .....	.7	.6	.4	.4	.2	.2	.4
Wages (million dollars)	1.4	1.5	1.3	1.8	1.5	2.6	5.7
Value added in mining (million dollars)	4.6	4.9	5.0	9.0	8.1	9.7	23.5
Cost of supplies used, purchased machinery installed, etc. (million dollars)	2.0	2.1	2.3	4.1	2.9	5.9	10.4
Value of shipments and receipts (million dollars)	5.8	6.5	5.5	11.0	9.7	12.8	31.1
Capital expenditures (million dollars) .....	.7	.5	1.8	2.0	1.3	2.7	2.8

^{1/} After 1963, data for single-unit establishments without paid employees were excluded from the census of mineral industries. Eight of the 12 establishments reported, including all 4 with 20 employees or more, were in SIC 142, crushed and broken stone, including riprap.

Source: U.S. Bureau of the Census, 1982 Census of Mineral Industries, Geographic Area Series, Pacific States, MIC82-A-9 (April 1985), tables 1 and 2a, and 1987 Census of Mineral Industries, United States, MIC87-SUM-1(P) (September 1989), table 2.

Table 603.-- NONFUEL MINERAL PRODUCTION: 1987 TO 1989

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

Minerals	1987	1988 <u>1/</u>	1989 <u>2/</u>
QUANTITY (1,000 SHORT TONS)			
Total	(X)	(X)	(X)
Cement:			
Masonry	10	10	10
Portland	324	354	500
Gem stones	(NA)	(NA)	(NA)
Lime	3	(W)	(Z)
Pumice	(W)	(W)	11,275
Sand and gravel (construction)	*700	652	600
Stone (crushed)	5,732	*5,700	6,100
VALUE (\$1,000)			
Total	73,479	74,932	92,596
Cement:			
Masonry	1,559	1,531	600
Portland	26,550	28,880	40,750
Gem stones	25	(W)	125
Lime	(W)	(W)	(Z)
Pumice	(W)	(W)	21
Sand and gravel (construction)	*3,500	3,173	3,200
Stone (crushed)	41,548	*41,000	47,900
Other industrial minerals <u>3/</u>	297	348	-

* Estimated.
 NA Not available.
 W Withheld to avoid disclosing company proprietary data; value included with "other industrial minerals."
 X Not applicable.
 Z Less than half the unit shown.
1/ Revised from Data Book 1989, table 585.
2/ Preliminary.
3/ Including values indicated by symbol W.
 Source: U.S. Bureau of Mines, "The Mineral Industry of Hawaii in 1989," Mineral Industry Surveys (1990).