

Section 20

FORESTRY, FISHERIES, AND MINING

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

Important sources of data on these subjects are *the United States Census of Mineral Industries* and *Mineral Industry Surveys*, U.S. Census Bureau, *1997 Economic Census, Geographic Area Series, Mining*, and reports and records of the Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources and Division of Forestry and Wildlife. *Historical Statistics of Hawaii*, Section 14, summarizes the data for earlier periods. Comparable national statistics are reported in the *Statistical Abstract of the United States: 2000*, Sections 24 and 25.

**Table 20.01-- FOREST AND NATURAL AREA ACREAGE, BY ISLANDS:
JUNE 30, 2000**

Island	Conservation district forest land		Natural areas 3/	
	Forest reserve land 1/	Private forest land 2/	Number of areas	Acres
2000				
State total	643,134	328,742	19	109,164
Hawaii	438,416	106,745	8	82,535
Maui	73,227	53,180	4	17,123
Kahoolawe	-	-	-	-
Lanai	-	6,150	-	-
Molokai	16,030	-	2	2,950
Oahu	32,462	88,817	3	1,770
Kauai	82,999	73,850	2	4,786
Niihau	-	-	-	-

Note: data has remain constant since 1996.

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.

3/ Includes Waimanu Research Reserve (3,600 acres) and Alakai Wilderness Preserve (9,939 acres).

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

Table 20.02-- WOODLAND ON FARMS, 1987 TO 1997, AND BY COUNTIES, 1997

[Acres]

Use	1987	1992	1997				
			State total	Hawaii	Maui	Honolulu	Kauai
Total	99,135	109,391	108,704	75,821	(D)	209	(D)
Pastured	27,517	40,909	31,844	14,645	(D)	-	(D)
Not pastured	71,618	68,482	76,860	61,176	(D)	20	(D)

D Withheld to avoid disclosing data for individual farms.

Source: U.S. Bureau of the Census, *1997 Census of Agriculture, Hawaii*, AC97-A-11 (March 1999), pp. 19 and 158.

**Table 20.03-- FOREST AND BRUSHLAND FIRES, BY COUNTIES:
1998 TO 2000**

[Years ended June 30]

County	Number of Fires			Acres burned		
	1998	1999	2000	1998	1999	2000
State total	145	161	107	15,756	22,051	22,483
Hawaii	80	64	71	14,059	2,551	21,031
Maui	38	63	11	863	17,743	319
Honolulu	20	15	12	833	1,615	1,100
Kauai	7	19	13	1	142	33

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

**Table 20.04-- FOREST AND BRUSHLAND FIRES, BY CAUSE OF FIRE:
1998 TO 2000**

County	Number of Fires			Acres burned		
	1998	1999	2000	1998	1999	2000
State total	205	132	125	37,314.8	20,375.8	2,931.3
Lighting	0	1	1	0.0	20.0	2.0
Campfire	9	3	3	0.9	1.6	0.3
Smoking	16	5	13	2,258.7	83.7	9.7
Debris burning	28	14	22	81.6	290.9	241.7
Arson	49	25	18	3,291.5	14,173.9	74.1
Equipment	16	8	11	847.8	572.3	2,197.6
Railroads	0	0	0	0.0	0.0	0.0
Children	11	4	13	2,473.7	7.4	12.7
Miscellaneous	76	72	44	28,360.6	5,226.0	393.2

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

Table 20.05-- COMMERCIAL FISHING: 1989 TO 2000

[Years ended June 30]

Year	Number of commercial fishermen	Commercial fish catch 1/		
		Pounds landed	Pounds sold	Value to primary producers (dollars)
1989	3,491	14,008,279	13,524,731	29,815,290
1990	3,551	16,663,945	16,090,478	39,902,182
1991	4,043	22,218,099	21,331,184	53,769,946
1992	3,800	23,578,601	22,761,039	55,381,574
1993	3,836	25,209,513	24,562,796	61,059,027
1994	4,060	24,028,693	23,310,535	57,999,092
1995	3,827	23,970,722	22,945,408	55,283,593
1996	3,672	23,968,916	23,018,189	52,443,466
1997	3,632	25,319,795	24,589,553	53,343,330
1998	3,648	26,191,724	25,264,158	55,854,728
1999 2/	3,796	26,874,045	25,845,545	54,848,585
2000	3,898	26,256,318	25,452,281	59,255,375

1/ Represents the total catches of all licensed commercial fishers. Includes both sea and pond catches.

2/ Revised.

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 20.06-- COMMERCIAL FISH CATCH, BY SPECIES: 1999

[Revised from previous year databook. Year ended June 30, 1999]

Species	Pounds caught	Pounds sold	Value (dollars)
Total catch	26,874,045	25,845,545	54,848,585
Sea catch, all species	26,867,568	25,839,068	54,833,480
Tunas	13,718,933	13,371,793	29,881,599
Aku (Skipjack)	1,546,783	1,423,949	1,770,720
Tombo	2,653,788	2,633,241	3,292,101
Bigeye (ahi)	5,671,155	5,632,985	16,855,542
Yellowfin (ahi)	3,821,438	3,661,370	7,880,328
Billfishes	6,834,227	6,691,208	12,662,924
Blue marlin	1,045,393	965,238	1,028,044
Shortnose spearfish	572,895	536,969	493,910
Striped marlin	1,116,049	1,092,028	1,212,612
Swordfish	4,066,974	4,065,180	9,900,017
Miscellaneous pelagic species	3,159,937	3,001,132	5,024,004
Mahimahi	946,238	869,345	1,956,632
Monchong	320,013	318,894	386,135
Ono	865,707	791,242	1,565,807
Opah	997,643	996,842	1,090,258
Deep bottom fishes	678,221	622,487	2,128,422
Ehu	35,622	32,389	117,247
Hapuupuu	84,890	81,630	211,765
Opakapaka	189,855	180,256	797,089
Uku	121,315	114,378	280,991
Ulaula (onaga)	125,549	117,982	563,109
Akule/opelu	1,337,115	1,230,534	1,902,237
Akule	1,075,746	983,486	1,471,622
Opelu	248,455	235,169	412,266
Jacks	96,724	84,818	136,142
Inshore fishes	325,769	302,194	644,299
Sharks	296,205	148,931	176,018
Sharks (unclassified)	184,306	59,636	87,919
Lobsters	105,153	102,651	1,032,129
Spiny	52,828	50,509	629,032
Slipper	52,325	52,142	403,097
Crabs	47,949	43,058	171,335
Shrimps	215,900	200,301	846,321
Laevigatus	214,590	199,043	842,374
Seaweeds	5,578	4,584	23,369
Miscellaneous	45,857	35,377	204,680
Pond landings, all species	6,477	6,477	15,106

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, *Commercial Fish Landings, State of Hawaii--Fiscal Years 1999* and records.

Table 20.07-- COMMERCIAL FISH CATCH, BY SPECIES: 2000

[Year ended June 30, 2000]

Species	Pounds caught	Pounds sold	Value (dollars)
Total catch	26,256,318	25,452,281	59,255,375
Sea catch, all species	26,254,922	25,451,074	59,249,924
Tunas	13,983,335	13,746,487	32,838,328
Aku (Skipjack)	1,408,402	1,328,567	1,833,792
Tombo	2,965,374	2,953,955	3,340,404
Bigeye (ahi)	5,623,768	5,595,201	18,741,644
Yellowfin (ahi)	3,961,887	3,847,725	8,825,312
Billfishes	6,119,277	5,978,757	13,483,575
Blue marlin	990,169	888,193	988,862
Shortnose spearfish	364,349	349,317	398,664
Striped marlin	674,234	660,389	1,072,513
Swordfish	4,068,017	4,060,760	10,998,346
Miscellaneous pelagic species	3,203,567	3,052,117	5,976,843
Mahimahi	1,392,062	1,304,160	2,855,314
Monchong	218,636	218,082	406,899
Ono	681,668	620,564	1,485,709
Opah	851,195	851,016	1,131,741
Deep bottom fishes	775,820	707,645	2,685,295
Ehu	44,291	41,230	157,696
Hapuupuu	54,793	51,809	174,941
Opakapaka	229,426	216,112	953,832
Uku	127,363	120,377	323,613
Ulaula (onaga)	192,033	182,480	900,512
Akule/opelu	1,473,879	1,363,984	2,120,025
Akule	1,166,081	1,082,771	1,622,021
Opelu	254,765	244,061	439,877
Jacks	64,287	52,818	106,586
Inshore fishes	277,715	260,402	550,153
Sharks	173,044	130,999	254,538
Lobsters	74,741	73,628	852,170
Spiny	34,007	32,966	479,501
Slipper	40,734	40,662	372,669
Crabs	31,209	26,078	105,697
Shrimps	16,301	7,916	53,261
Seaweeds	8,492	7,777	25,866
Miscellaneous	53,255	42,466	197,587
Pond landings, all species	1,396	1,207	5,452

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, *Commercial Fish Landings, State of Hawaii--Fiscal Years 2000* and records.

Table 20.08-- COMMERCIAL SEA LANDINGS, BY ISLANDS: 1999 AND 2000

[Years ended June 30]

Island	Pounds landed	Pounds sold	Value (dollars)
1999 1/			
State total	26,867,568	25,839,068	54,833,480
Hawaii	3,604,377	3,359,220	5,927,819
Maui	674,377	513,133	1,399,673
Lanai	21,316	14,932	31,300
Molokai	39,668	34,510	127,493
Oahu	21,732,979	21,231,579	45,890,368
Kauai and Niihau	794,851	685,694	1,456,827
2000			
State total	26,254,922	25,451,074	59,249,924
Hawaii	3,852,202	3,653,913	6,746,191
Maui	579,026	452,306	1,370,315
Lanai	18,044	12,963	31,543
Molokai	48,311	36,944	124,789
Oahu	20,892,782	20,537,700	49,155,833
Kauai and Niihau	864,557	757,248	1,821,253

1/ Revised.

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

**Table 20.09-- COMMERCIAL SEA LANDINGS, BY FISHING METHOD:
1999 AND 2000**

[Years ended June 30]

Fishing method	Pounds landed	Pounds sold	Value (dollars)
1999 1/			
All methods	26,867,568	25,839,068	54,833,480
Aku pole and line	1,057,817	1,054,768	1,283,866
Longline	17,495,119	17,378,694	37,819,974
Handline	3,771,671	3,509,250	7,284,394
Trolling	2,834,173	2,325,528	4,375,530
Net	1,207,408	1,101,995	1,671,363
Trap	398,943	380,814	2,002,153
All other methods	102,437	88,019	396,200
2000			
All methods	26,254,922	25,451,074	59,249,924
Aku pole and line	1,012,727	1,011,869	1,410,257
Longline	16,369,922	16,309,366	40,347,245
Handline	4,544,518	4,357,277	9,572,029
Trolling	2,786,066	2,354,122	4,819,316
Net	1,279,849	1,184,464	1,764,228
Trap	147,371	138,345	919,996
All other methods	114,469	95,631	416,852

1/ Revised.

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, *Commercial Fish Landings, State of Hawaii--Fiscal Years 1999-2000* and records.

**Table 20.10-- FISH POPULATIONS AROUND SELECTED SHORELINE
AREAS: YEAR ENDED JUNE 30, 2000**

Location	Species	Fish per acre	Pounds per acre
Marine Life Conservation Districts:			
Hanauma Bay, Oahu:			
Inshore	64	3,464	1,364
Offshore	86	4,755	566
Pupukea, Oahu	96	2,488	228
Waikiki, Oahu	45	2,851	328
Molokini Shoal, Maui	57	5,276	570
Honolua-Mokuleia Bay, Maui	41	7,961	1,043
Manele-Hulopoe Bays, Lanai	55	6,608	450
Artificial reefs:			
Maunalua Bay Tire Reef, Oahu	49	3,700	386
Maunalua Bay "Cee Bee 24 Barge," Oahu	54	3,539	839
Maunalua Bay "Mud Scow Barge," Oahu	38	5,429	427
Maunalua Bay "Keehi Barge," Oahu	22	3,247	268
Waianae "Z-Slabs," Oahu	65	4,586	911
Waianae "Landing Craft," Oahu	65	4,586	911
Keawakapu Tire Reef, Maui	(NA)	7,102	1,053
Fisheries Management Areas:			
Waikiki-Diamond Head, Oahu 1/	59	1,218	166
Waikiki-Diamond Head, Oahu 2/	54	936	85

NA Not available.

1/ Survey taken on December 30, 1999, prior to the open fishing period.

2/ Survey taken on June 8, 2000, during the open fishing period.

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, 1999 to June 30, 2000.*

Table 20.11-- MOST ABUNDANT AND HEAVIEST FISH SPECIES AT SPECIFIED LOCATIONS: YEAR ENDED JUNE 30, 2000

[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
Hanauma Bay MLCD (inshore):				
Manini (<i>Acanthurus triostegus</i>)	1	886	5	91
Saddle-back wrasse (<i>Thalassoma duperrey</i>)	2	327	10	27
Kole (<i>Ctenochaetus strigosus</i>)	3	199	8	33
Redlipped parrot (<i>Scarus rubroviolaceus</i>)	(1/)	(NA)	1	405
Mullet (<i>Mugil cephalus</i>)	(1/)	(NA)	2	142
Clown tang (<i>Naso lituratus</i>)	(1/)	(NA)	3	120
Waikiki MLCD:				
Manini (<i>Acanthurus triostegus</i>)	1	718	2	74
Saddle-back wrasse (<i>Thalassoma duperrey</i>)	2	397	4	19
Ohua/green wrasse (<i>Stethojulis balteata</i>)	3	381	6	10
Kala (<i>Naso unicornis</i>)	8	97	1	121
Maiii/lavender tang (<i>Acanthurus nigrofuscus</i>)	6	177	3	22
Honolua-Mokuleia Bay MLCD:				
Saddle-back wrasse (<i>Thalassoma duperrey</i>)	1	2,185	5	92
Maiii/lavender tang (<i>Acanthurus nigrofuscus</i>)	2	1,861	4	135
Kole (<i>Ctenochaetus strigosus</i>)	3	809	6	58
Kala (<i>Naso unicornis</i>)	6	202	1	225
Clown tang (<i>Naso lituratus</i>)	9	172	2	217
Nenuē (<i>Kyphosus</i> sp.)	4	607	3	136

NA Not available.

MLCD Marine Life Conservation District.

1/ Not in first 10.

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, 1999 to June 30, 2000.*

Table 20.12-- MINERAL INDUSTRIES: 1972 TO 1997

Subject	1972	1977	1982	1987	1992	1997
Number of establishments	15	7	12	9	7	7
With 20 employees or more	5	2	4	4	4	2
All employees:						
Number (1,000)	.3	.1	.2	.2	.2	.1
Payroll (million dollars)	2.4	1.9	3.8	7.4	9.4	5.6
Production, development, and exploration workers:						
Number (1,000)	.2	.1	.1	.2	.2	.1
Hours (millions)	.4	.2	.2	.4	.4	.2
Wages (million dollars)	1.8	1.5	2.6	5.7	8.1	4.7
Value added by mining (million dollars)	9.0	8.1	9.7	23.5	27.3	22.0
Cost of supplies used, purchased machinery installed, etc. (million dollars)	4.1	2.9	5.9	10.4	11.3	(D)
Value of shipments and receipts (million dollars)	11.0	9.7	12.8	31.1	33.7	33.3
Capital expenditures (million dollars)	2.0	1.3	2.7	2.8	4.8	(D)

D Withheld to avoid disclosing data for individual companies.

Source: U.S. Census Bureau, *1987 Census of Mineral Industries, Geographic Area Series, Pacific States*, MIC87-A-9 (October 1990), Hawaii table 1; *1992 Census of Mineral Industries, Geographic Area Series, Pacific States*, MIC92-A-9 (May 1996), Hawaii table 1; *1997 Economic Census, Mining, Geographic Area Series, Hawaii*, EC97N21A-HI (May 2000), table 1.

Table 20.13-- NONFUEL MINERAL PRODUCTION: 1997 TO 1999

[Estimated production as measured by mine shipments, sales, or marketable production, including consumption by producers, Data are rounded to three significant digits; may not add to totals shown]

Minerals	1997	1998 1/	1999 2/
QUANTITY (1,000 METRIC TONS)			
Cement:			
Masonry	3	3	3
Portland	252	251	257
Gemstones	(NA)	(NA)	(NA)
Sand and gravel (construction)	378	368	400
Stone (crushed)	5,560	5,500	5,700
VALUE (\$1,000)			
Total	93,700	84,500	88,800
Cement:			
Masonry 3/	332	329	300
Portland 3/	29,600	25,600	26,000
Gemstones	66	77	105
Sand and gravel (construction)	4,210	4,590	5,090
Stone (crushed)	59,500	53,900	57,300

NA Not available.

1/ Revised.

2/ Preliminary.

3/ For 1997 to 1999, data have been estimated.

Source: U.S. Geological Survey, Bureau of Mines, "The *Mineral Industry of Hawaii*" from internet address <http://minerals.er.usgs.gov/minerals/pubs/state/hi.html>.