

Section 20: Forests, Fisheries, and Mining



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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: 1999*, Sections 24 and 25.

**Table 20.01-- FOREST AND NATURAL AREA ACREAGE, BY ISLANDS:
JUNE 30, 1996 AND JUNE 30, 1997**

Island	Conservation district forest land		Planted forest		Natural areas 3/	
	Forest reserve land 1/	Private forest land 2/	Planted in preceding 3 years	Total standing	Number of areas	Acres
1996						
State total	643,134	328,742	108	46,191	19	109,164
Hawaii	438,416	106,745	13	17,138	8	82,535
Maui	73,227	53,180	15	11,892	4	17,123
Kahoolawe	-	-	-	-	-	-
Lanai	-	6,150	-	512	-	-
Molokai	16,030	-	10	3,238	2	2,950
Oahu	32,462	88,817	63	7,162	3	1,770
Kauai	82,999	73,850	7	6,249	2	4,786
Niihau	-	-	-	-	-	-
1997						
State total	643,134	328,742	108	46,191	19	109,164
Hawaii	438,416	106,745	13	17,138	8	82,535
Maui	73,227	53,180	15	11,892	4	17,123
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Lanai	-	6,150	-	512	-	-
Molokai	16,030	-	10	3,238	2	2,950
Oahu	32,462	88,817	63	7,162	3	1,770
Kauai	82,999	73,850	7	6,249	2	4,786
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.

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:
1995 TO 1997**

[Years ended June 30]

County	Number of Fires			Acres burned		
	1995	1996	1997	1995	1996	1997
State total	198	131	69	23,946	477	378
Hawaii	86	78	30	21,635	232	40
Maui	44	42	24	2,019	67	40
Honolulu	67	10	11	292	175	297
Kauai	1	1	4	0	3	1

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

Table 20.04-- COMMERCIAL FISHING: 1989 TO 1999

[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	3,796	25,959,350	24,994,423	53,292,964

1/ Represents the total catches of all licensed commercial fishers. Includes both sea and pond 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 20.05-- COMMERCIAL FISH CATCH, BY SPECIES: 1998

[Year ended June 30, 1998]

Species	Pounds caught	Pounds sold	Value (dollars)
Total catch	26,191,724	25,264,158	55,854,728
Sea catch, all species	26,183,860	25,256,294	55,836,548
Tunas	15,035,773	14,679,503	33,336,805
Aku (Skipjack)	2,202,070	2,106,589	2,640,916
Tombo	2,532,880	2,489,388	3,115,247
Bigeye (ahi)	6,456,216	6,372,575	18,727,223
Yellowfin (ahi)	3,782,682	3,662,960	8,685,741
Billfishes	5,986,078	5,834,058	11,534,630
Blue marlin	1,410,919	1,290,802	1,343,884
Shortnose spearfish	163,984	154,280	152,040
Striped marlin	560,086	549,480	887,182
Swordfish	3,821,959	3,812,774	9,115,766
Miscellaneous pelagic species	2,124,068	2,006,602	3,939,760
Mahimahi	623,251	574,858	1,460,680
Monchong	194,854	193,148	292,152
Ono	662,525	603,597	1,392,772
Opah	622,049	616,355	779,079
Deep bottom fishes	731,998	666,271	2,486,975
Hapuupuu	73,217	69,686	199,483
Opakapaka	229,561	219,859	1,007,698
Uku	105,582	100,258	300,532
Ulaula (onaga)	115,753	110,726	610,269
Akule/opelu	1,545,384	1,411,658	2,023,403
Akule	1,182,400	1,066,281	1,485,922
Opelu	296,308	281,820	443,214
Jacks	107,148	91,867	154,358
Inshore fishes	313,761	287,729	653,144
Menpachi	48,753	45,224	138,893
Sharks	110,975	72,324	69,876
Lobsters	102,626	100,546	1,180,592
Spiny	57,714	55,717	754,768
Slipper	44,912	44,829	425,824
Crabs	46,664	40,483	164,135
Kona crab	29,210	23,292	105,706
Shrimps	21,537	20,496	141,170
Laevigatus	21,157	20,416	140,770
Seaweeds	6,089	4,883	31,092
Miscellaneous	51,759	39,874	120,608
Pond landings, all species	7,864	7,864	18,180

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, *Commercial Fish Landings, State of Hawaii--Fiscal Years 1998* and records.

Table 20.06-- COMMERCIAL FISH CATCH, BY SPECIES: 1999

[Year ended June 30, 1999]

Species	Pounds caught	Pounds sold	Value (dollars)
Total catch	25,959,350	24,994,423	53,292,964
Sea catch, all species	25,952,873	24,987,946	53,277,858
Tunas	13,203,183	12,866,182	28,886,371
Aku (Skipjack)	1,534,667	1,414,207	1,759,274
Tombo	2,609,693	2,590,954	3,240,805
Bigeye (ahi)	5,577,038	5,539,058	16,507,235
Yellowfin (ahi)	3,456,810	3,301,953	7,296,398
Billfishes	6,703,173	6,563,218	12,416,325
Blue marlin	1,022,151	943,389	1,004,731
Shortnose spearfish	564,689	529,623	488,032
Striped marlin	1,086,246	1,063,036	1,183,397
Swordfish	3,997,401	3,995,607	9,712,032
Miscellaneous pelagic species	3,077,373	2,924,329	4,875,847
Mahimahi	908,991	835,466	1,881,202
Monchong	314,941	313,822	382,191
Ono	832,229	760,149	1,509,299
Opah	991,432	990,631	1,078,459
Deep bottom fishes	670,209	614,817	2,127,281
Ehu	35,599	32,370	117,191
Hapuupuu	84,694	81,434	210,929
Opakapaka	191,653	182,141	807,840
Uku	120,516	113,604	278,590
Ulaula (onaga)	124,870	117,355	561,163
Akule/opelu	1,218,177	1,118,030	1,743,551
Akule	964,941	878,014	1,324,830
Opelu	241,647	229,494	402,504
Jacks	95,159	83,533	134,054
Inshore fishes	312,304	290,692	622,059
Sharks	247,488	136,041	160,130
Miscellaneous	137,770	47,829	73,182
Lobsters	109,499	106,994	1,081,723
Spiny	53,008	50,686	631,367
Slipper	56,491	56,308	450,356
Crabs	47,129	42,450	168,643
Shrimps	215,900	200,301	846,321
Laevigatus	214,590	199,043	842,374
Seaweeds	5,454	4,464	23,139
Miscellaneous	47,825	36,895	192,414
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 1998* and records.

Table 20.07-- COMMERCIAL SEA LANDINGS, BY ISLANDS: 1998 AND 1999

[Years ended June 30]

Island	Pounds landed	Pounds sold	Value (dollars)
1998			
State total	26,183,860	25,256,294	55,836,548
Hawaii	3,445,696	3,238,596	6,149,812
Maui	665,825	538,957	1,245,598
Lanai	20,204	13,330	31,294
Molokai	62,120	52,887	187,178
Oahu	20,993,721	20,548,332	46,315,574
Kauai and Niihau	996,294	864,192	1,907,092
1999			
State total	25,952,873	24,987,946	53,277,858
Hawaii	3,357,211	3,119,233	5,513,977
Maui	655,840	495,846	1,363,401
Lanai	21,316	14,932	31,300
Molokai	43,266	38,223	149,053
Oahu	21,125,074	20,672,786	44,845,429
Kauai and Niihau	750,166	646,926	1,374,698

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

**Table 20.08-- COMMERCIAL SEA LANDINGS, BY FISHING METHOD:
1998 AND 1999**

[Years ended June 30]

Fishing method	Pounds landed	Pounds sold	Value (dollars)
1998			
All methods	26,183,860	25,256,294	55,836,549
Aku pole and line	1,707,795	1,703,358	2,138,854
Longline	16,147,761	15,963,726	37,686,212
Handline	3,619,898	3,447,251	7,827,921
Trolling	2,701,378	2,285,515	4,429,295
Net	1,387,647	1,259,141	1,784,750
Trap	204,760	202,537	1,417,721
Albacore troll	303,721	303,214	225,960
All other methods	110,900	91,552	325,836
1999			
All methods	25,952,873	24,987,946	53,277,858
Aku pole and line	1,057,817	1,054,768	1,283,866
Longline	17,222,110	17,105,835	37,134,427
Handline	3,343,433	3,118,990	6,691,234
Trolling	2,742,010	2,251,413	4,229,791
Net	1,082,448	984,806	1,509,285
Trap	403,309	385,180	2,052,007
All other methods	101,746	86,954	377,248

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, *Commercial Fish Landings, State of Hawaii--Fiscal Years 1998-1999* and records.

**Table 20.09-- FISH POPULATIONS AROUND SELECTED SHORELINE
AREAS: YEAR ENDED JUNE 30, 1999**

Location	Species	Fish per acre	Pounds per acre
Marine Life Conservation Districts:			
Hanauma Bay, Oahu:			
Inshore	66	3,308	1,578
Pupukea, Oahu	95	1,602	196
Waikiki, Oahu	54	1,080	110
Molokini Shoal, Maui	90	1,990	354
Honolua-Mokuleia Bay, Maui	29	3,126	1,786
Manele-Hulopoe Bays, Lanai	91	2,958	616
Kealakekua Bay, Hawaii	46	3,305	173
Lapakahi, Hawaii	49	3,755	319
Wailea Bay, Hawaii	49	2,599	274
Old Kona Airport, Hawaii	25	3,858	117
Artificial reefs:			
Maunalua Bay, Oahu (tire modules)	53	3,639	334
Waianae, Oahu (Z-Slabs)	36	1,510	264
Keawakapu, Maui	28	1,877	253
Fisheries Management Areas:			
Waikiki-Diamond Head, Oahu	59	916	143
Puako Bay-Puako Reef, Hawaii	36	1,452	180
Red Hill, Hawaii	19	1,295	41
Kiholo Bay, Hawaii	45	4,155	234
Papawai Bay, Hawaii	29	5,976	344
Other areas:			
Honaunau Bay	35	3,838	215

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, 1998 to June 30, 1999.*

Table 20.10-- MOST ABUNDANT AND HEAVIEST FISH SPECIES AT SPECIFIED LOCATIONS: YEAR ENDED JUNE 30, 1999

[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	743	3	97
Mamo (<i>Abudefduf abdominalis</i>)	2	530	7	74
Taape (<i>Lutjanus kasmira</i>)	3	244	2	101
Redlipped parrot (<i>Scarus rubroviolaceus</i>)	(1/)	(NA)	1	508
Waikiki MLCD:				
Manini (<i>Acanthurus triostegus</i>)	1	145	4	11
Saddle-back wrasse (<i>Thalassoma duperrey</i>)	2	133	5	7
Mamo (<i>Abudefduf abdominalis</i>)	3	93	(1/)	(NA)
Kala (<i>Naso unicornis</i>)	(1/)	(NA)	1	22
Clown tang (<i>Naso lituratus</i>)	(1/)	(NA)	2	13
Maiii/lavender tang (<i>Acanthurus nigrofuscus</i>)	5	76	3	12
Kealakekua Bay MLCD:				
Agile damsel (<i>Chromis agilis</i>)	1	657	10	5
Kole (<i>Ctenochaetus strigosus</i>)	2	454	2	22
Maiii/lavender tang (<i>Acanthurus nigrofuscus</i>)	3	387	5	10
Yellow tang (<i>Zebrasoma flavescens</i>)	5	270	1	23
Nae nae (<i>Acanthurus olivaceus</i>)	(1/)	(NA)	3	20

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, 1998 to June 30, 1999.*

Table 20.11-- 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 20.12-- NONFUEL MINERAL PRODUCTION: 1996 TO 1998

[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	1996	1997 1/	1998 2/
QUANTITY (1,000 METRIC TONS)			
Cement:			
Masonry	5	3	3
Portland	312	252	261
Gemstones	(NA)	(NA)	(NA)
Sand and gravel (construction)	(D)	378	378
Stone (crushed)	6,560	5,560	5,000
VALUE (\$1,000)			
Total 3/	110,000	93,700	85,500
Cement:			
Masonry 4/	500	332	300
Portland 4/	32,000	29,600	31,000
Gemstones	153	66	33
Sand and gravel (construction)	(D)	4,210	4,210
Stone (crushed)	77,500	59,500	50,000

NA Not available.

D Withheld to avoid disclosing company proprietary data.

1/ Revised.

2/ Preliminary.

3/ Partial total, excludes values that must be concealed to avoid disclosing company proprietary data.

4/ For 1996 & 1997, 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>.