

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*, 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: 1996*, Sections 24 and 25.

**Table 20.01-- FOREST AND NATURAL AREA ACREAGE, BY ISLANDS:
JUNE 30, 1995**

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
State total	622,339	328,742	108	46,191	21	122,703
Hawaii	422,355	106,745	13	17,138	9	86,135
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	27,728	88,817	63	7,162	3	1,770
Kauai	82,999	73,850	7	6,249	3	14,725
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, 1982 TO 1992, AND BY COUNTIES, 1992

[Acres]

Use	1982	1987	1992				
			State total	Hawaii	Maui	Honolulu	Kauai
Total	117,270	99,135	109,391	79,319	(D)	1,094	(D)
Pastured	36,550	27,517	40,909	22,606	(D)	474	(D)
Not pastured	80,720	71,618	68,482	56,713	10,047	620	1,102

D Withheld to avoid disclosing data for individual farms.

Source: U.S. Bureau of the Census, *1992 Census of Agriculture, Hawaii*, AC92-A-11 (October 1994), pp. 17 and 156.

**Table 20.03-- FOREST AND BRUSHLAND FIRES, BY COUNTIES:
1993 TO 1995**

[Years ended June 30]

County	Number of fires			Acres burned		
	1993	1994	1995	1993	1994	1995
State total	118	108	198	4,287	5,085	23,946
Hawaii	64	59	86	2,148	3,533	21,635
Maui	15	5	44	225	448	2,019
Honolulu	36	40	67	1,911	1,103	292
Kauai	3	4	1	4	1	0

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

Table 20.04-- COMMERCIAL FISHING: 1989 TO 1994

[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

1/ Represents the total catches of all licensed commercial fishers. Includes both sea and pond catches. Data for 1989-1993 revised from *Data Book 1993-94*, table 20.5.

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: 1994

[Year ended June 30, 1994]

Species	Pounds caught	Pounds sold	Value (dollars)
Total catch	24,028,693	23,310,535	57,999,092
Sea catch, all species	24,000,859	23,283,573	57,938,896
Tunas	11,212,282	10,961,670	26,899,020
Aku (Skipjack)	2,747,983	2,658,781	3,231,826
Ahipalaha	864,047	858,860	956,804
Bigeye (ahi)	3,812,120	3,767,931	14,015,363
Yellowfin (ahi)	3,740,866	3,634,939	8,367,726
Billfishes	8,879,709	8,685,390	22,505,032
Blue marlin	1,360,439	1,244,961	1,187,379
Striped marlin	1,025,953	989,083	1,279,280
Swordfish	6,302,444	6,270,797	19,839,121
Miscellaneous pelagic species	1,584,197	1,480,540	3,009,591
Mahimahi	702,053	639,122	1,491,610
Ono	370,484	338,850	954,208
Opah	407,702	402,792	407,402
Deep bottom fishes	802,684	766,295	2,794,075
Opakapaka	349,597	339,507	1,324,801
Uku	117,117	114,815	359,441
Ulaula	111,116	107,859	595,077
Akule/opelu	821,980	786,328	1,384,781
Akule	484,450	466,894	813,516
Opelu	314,633	297,204	525,582
Jacks	127,262	116,382	204,581
Inshore fishes	288,890	268,079	542,233
Sharks	145,558	100,034	100,117
Lobsters	1,472	867	5,683
Crabs	49,015	45,370	175,773
Shrimps	43,415	38,488	197,533
Seaweeds	7,112	6,177	34,477
Miscellaneous	37,283	27,953	86,000
Pond landings, all species	27,834	26,962	60,196

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, *Commercial Fish Landings, State of Hawaii--Fiscal Years 1993-1994*.

Table 20.06-- COMMERCIAL SEA LANDINGS, BY ISLANDS: 1993 AND 1994

[Years ended June 30]

Island	Pounds landed	Pounds sold	Value (dollars)
1993			
State total	25,185,107	24,538,772	61,007,332
Hawaii	3,769,233	3,617,773	6,222,003
Maui	436,987	343,371	897,947
Lanai	27,282	23,828	57,488
Molokai	52,820	42,299	95,025
Oahu	20,378,185	20,069,661	52,726,368
Kauai and Niihau	520,600	441,840	1,008,501
1994			
State total	24,000,859	23,283,573	57,938,896
Hawaii	3,692,005	3,492,782	6,348,052
Maui	551,010	427,490	1,025,214
Lanai	18,387	13,892	33,949
Molokai	51,917	42,467	110,982
Oahu	19,002,745	18,723,718	48,979,936
Kauai and Niihau	684,795	583,224	1,440,763

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, *Commercial Fish Landings, State of Hawaii--Fiscal Years 1992-1993 and 1993-1994*, as revised.

**Table 20.07-- COMMERCIAL SEA LANDINGS, BY FISHING METHOD:
1993 AND 1994**

[Years ended June 30]

Fishing method	Pounds landed	Pounds sold	Value (dollars)
1993			
All methods	25,185,107	24,538,772	61,007,332
Aku pole and line	1,453,461	1,443,408	2,119,505
Longline	16,650,591	16,566,096	44,734,833
Handline	3,412,024	3,328,110	7,032,187
Trolling	2,328,895	1,979,477	3,687,012
Net	1,001,168	930,289	1,360,824
Trap	227,500	203,551	1,831,157
All other methods	111,468	87,841	241,814
1994			
All methods	24,000,859	23,283,573	57,938,896
Aku pole and line	2,386,748	2,380,001	2,765,011
Longline	14,346,651	14,211,286	41,120,838
Handline	3,511,625	3,407,069	7,842,661
Trolling	2,861,204	2,436,350	4,525,508
Net	687,836	665,729	1,079,846
Trap	79,027	73,884	298,262
All other methods	127,768	109,272	306,770

Source: Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources, *Commercial Fish Landings, State of Hawaii--Fiscal Years 1992-1993 and 1993-1994*, as revised.

**Table 20.08-- FISH POPULATIONS AROUND SELECTED SHORELINE
AREAS: YEAR ENDED JUNE 30, 1995**

Location	Species	Fish per acre	Pounds per acre
Marine Life Conservation Districts:			
Hanauma Bay, Oahu:			
Inshore	54	5,423	5,056
Offshore	79	1,577	243
Pupukea, Oahu	84	1,832	144
Waikiki, Oahu	39	1,586	271
Molokini Shoal, Maui	105	2,683	319
Honolua Bay, Maui	56	1,767	510
Manele-Hulopoe Bays, Lanai	93	4,085	477
Lapakahi, Hawaii	62	935	103
Kealakekua Bay, Hawaii	55	1,518	238
Wailea Bay, Hawaii	62	918	94
Old Kona Airport, Hawaii	44	1,718	404
Artificial reefs:			
Maunalua Bay, Oahu (tire modules)	48	1,888	394
Waianae, Oahu (tire modules)	(NA)	(NA)	294
Keawakapu, Maui	38	2,890	385
Fisheries Management Areas:			
Waikiki-Diamond Head, Oahu	62	2,353	318
Red Hill, Hawaii	45	3,157	131
Pupawai, Hawaii	55	4,834	343
Other areas:			
Honaunau Bay	47	1,628	154

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, 1994 to June 30, 1995.*

Table 20.09-- MOST ABUNDANT AND HEAVIEST FISH SPECIES AT SPECIFIED LOCATIONS: YEAR ENDED JUNE 30, 1995

[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	1,149	6	214
Pualu (<i>Acanthurus xanthopterus</i>)	2	745	1	1,873
Saddle-back wrasse (<i>Thalassoma duperrey</i>)	3	607	9	87
Awa awa (<i>Elops hawaiiensis</i>)	(1/)	(NA)	2	1,317
Clown tang	8	211	3	276
Waikiki MLCD:				
Ohua/green wrasse	1	290	(1/)	(NA)
Manini (<i>Acanthurus triostegus</i>)	2	227	3	18
Saddle-back wrasse (<i>Thalassoma duperrey</i>)	3	218	4	17
Maiii/lavender tang	4	209	1	65
Kala	(1/)	(NA)	2	65
Kealakekua Bay MLCD:				
Eleele	1	323	1	103
Chocolate dip damsel	2	312	6	9
Kole (<i>Ctenochaetus strigosus</i>)	3	237	4	17
Red weke	6	47	2	18
Yellow tang (<i>Zebrasoma flarescens</i>)	4	178	3	17

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, 1994 to June 30, 1995.*

Table 20.10 MINERAL INDUSTRIES: 1967 TO 1992

Subject	1967	1972	1977	1982	1987	1992
Number of establishments	12	15	7	12	9	7
With 20 employees or more	3	5	2	4	4	4
All employees:						
Number (1,000)	.2	.3	.1	.2	.2	.2
Payroll (million dollars)	1.6	2.4	1.9	3.8	7.4	9.4
Production, development, and exploration workers:						
Number (1,000)	.2	.2	.1	.1	.2	.2
Hours (millions)	.4	.4	.2	.2	.4	.4
Wages (million dollars)	1.3	1.8	1.5	2.6	5.7	8.1
Value added by mining (million dollars)	5.0	9.0	8.1	9.7	23.5	27.3
Cost of supplies used, purchased machinery installed, etc. (million dollars)	2.3	4.1	2.9	5.9	10.4	11.3
Value of shipments and receipts (million dollars)	5.5	11.0	9.7	12.8	31.1	33.7
Capital expenditures (million dollars)	1.8	2.0	1.3	2.7	2.8	4.8

Source: U.S. Bureau of the Census, *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.

Table 20.11-- NONFUEL MINERAL PRODUCTION: 1993 TO 1995

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

Minerals	1993 1/	1994 1/	1995 2/
QUANTITY (1,000 METRIC TONS)			
Cement:			
Masonry	7.26	6.00	4.44
Portland	451	404	215
Sand and gravel (construction)	(W)	521	600
Stone (crushed) 3/	8,460	8,170	8,500
VALUE (\$1,000)			
Total 3/	139,000	116,000	106,000
Cement:			
Masonry	880	395	316
Portland	48,300	28,300	15,100
Sand and gravel (construction)	(W)	4,740	5,700
Stone (crushed) 3/	81,400	82,300	85,000
Other industrial minerals	8,140	(W)	(W)

W Withheld to avoid disclosing company proprietary data.

1/ Revised.

2/ Preliminary.

3/ Excludes certain stones, to avoid disclosing data for individual firms.

Source: U.S. Geological Survey, Bureau of Mines, *Mineral Industry Surveys, Hawaii* (1996).