ESTIMATED HARVESTS OF FISH, WILDLIFE, AND WILD PLANT RESOURCES BY ALASKA REGION AND CENSUS AREAS, 2017

DIVISION OF SUBSISTENCE, ALASKA DEPARTMENT OF FISH AND GAME

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INTRODUCTION

Since the late 1980s, the Division of Subsistence of the Alaska Department of Fish and Game has applied the results of systematic, comprehensive household surveys to estimate regional and statewide harvests of fish, wildlife, and wild plants (Wolfe and Walker 1987, ADF&G 1989). The community data sets upon which these estimates are based are summarized in the Community Subsistence Information System (CSIS) (formerly the Community Profile Database or "CPDB"). Updated regional and statewide estimates were published in Fall 2016a (pertaining to 2012) and in *Subsistence in Alaska: A Year 2014 Update* (Fall 2016b), and *Subsistence in Alaska: A Year 2017 Update* (Fall 2018). This report provides additional detail about the harvest estimates summarized in the *2017 Update*, modeled after several tables that appear in Fall 2016a (Table 2, Table 3, Table 6).

ESTIMATING RURAL HARVESTS

Data used to estimate 2017 harvests in rural Alaska communities were derived from research conducted by the Division of Subsistence and by other entities, and summarized in, or soon to be included in, the Community Subsistence Information System (CSIS). Data from 12 communities included in the CSIS were omitted from analysis because they have not been resurveyed since the first statewide harvest estimate was developed for the 1980s (Wolfe and Walker 1987) or are represented by more recently collected data in other communities in their census area. The data available for 219 rural census places represents 84.2% of Alaska's rural population and 83.0% of rural communities (Table 1). At least one year of data was available for a large majority of communities in all regions but Western (47%). Data were available for 60% or more of the population of all regions.

As shown in Table 2, data for 27.4% of the communities upon which the harvest estimates are based represent study years from 2013 through 2017; for 37.9% of communities, data represent study years from 2008 through 2012; for 21.5%, data pertain to study years from 1998 through 2007; for the remaining 13.2% of communities, data pertain to study years more than 20 years before 2017. All of the data for Kodiak Island Borough communities are more than 10 years old, as are 72% of the data sets for the southeast region. Most of the data sets used to estimate harvests for the Arctic Region (63%), Interior Region (94%), Southcentral Region (89%), and Western Region (94%) were based on study years from 2008 to 2017 (10 years or less).

Total harvests for each resource category were first computed for each subregion (boroughs or census areas) based on per capita harvest estimates and population estimates, as follows.

$$Pop_u = \sum_{ui=1}^{N_u} pop_{ui}$$

$$C_u = \frac{\sum_{ui=1}^{n_u}(k_{ui} \times pop_{ui})}{\sum_{ui=1}^{n_u} pop_{ui}}$$

$$X_u = C_u \times Pop_u$$

Where:

X_u = estimated total harvest of a resource category for subregion *u*,

C_u = estimated per capita harvest of a resource category for subregion *u*,

n_u = total number of communities where per capita estimates are available for subregion *u*,

pop_{ui} = population estimate for community *i* in subregion *u*,

k_{ui} = most recent available per capita value of a resource category for community *i* in subregion *u*,

N_u = total number of communities in subregion *u*, and

Pop_u = total population in subregion *u*

Harvest totals and per capita estimates for regions were generated by:

$$X_r = \sum_{ru=1}^{U_r} X_{ru}$$

$$C_r = X_r \div \sum_{ru=1}^{U_r} Pop_{ru}$$

Where:

X_r = estimated total harvest for resource categories for region *r*,

X_{ru} = estimated total harvest for subregion *u* in region *r,*

C_r = estimated per capita harvest for region *r*,

U_r = total number of subregions in region *r*, and

Pop_{ru} = total population for subregions *u* in region *r*.

Statewide estimates of harvest by rural residents were created by summing each of the rural regions.

$$X_w = \sum_{r=1}^{R} X_r$$

$$C_w = \frac{X_w}{Pop_r}$$

Where:

X_w = Estimated total harvest of a resource category for all rural Alaska places,

C_w = estimated per capita harvest of a resource category for all rural Alaska places,

R = the total number of rural Alaska regions, and

Pop_r = the total population of rural Alaska places

Population estimates for 2017 were used as the demographic reference (ADLWD 2018). Populations of military or industrial CDPs (e.g. Attu Station, Red Dog Mine) and populations living in group quarters (primarily seafood processing facilities occupied by seasonal workers) were assumed to not engage in subsistence harvests; subregional population totals were adjusted accordingly.

No comprehensive data were available for the regional center of Nome (2017 population = 3,691 or 36.9% of the Nome Census Area). Usually, regional center harvests are lower than those of smaller communities. For example, in 2012, Bethel's per capita harvest was 26% of the average harvest for smaller communities in the Lower Kuskokwim Census Subarea. Therefore, applying average harvest estimates of small communities to regional centers likely results in overestimated total harvests. Nome's total subsistence harvest was calculated as 32.9% of the harvests in smaller communities in the census area, based on the proportion of its 2015–2017 average subsistence salmon harvest related to the smaller communities' average salmon harvest.

Because comprehensive harvest data for 3 of the 6 communities of the Aleutians West Census Area have not been collected since the early 1990s, more recent harvest estimates for key species based on annual harvest monitoring programs were substituted for the older data. This included salmon, halibut, and sea lions for Unalaska; and sea lions, fur seals, and halibut for St. George and St. Paul.

ESTIMATING URBAN HARVESTS

The CSIS includes comprehensive harvest data sets for 30 urban Alaska communities, which represent 35% of all urban census places but only 7.4% of the urban population. These data were not used in this analysis because they incompletely represent urban harvests. Instead, data from annual harvest monitoring programs for fish, big game, and marine mammals were used to estimate noncommercial harvests by residents of urban areas. For each nonsubsistence area, harvest estimates were calculated based on the 2015–2017 average per capita harvests and populations. Subsistence and personal use fish harvests were estimated based on permit returns. ADF&G's Division of Sport Fish analyzed the angler survey data to produce estimates of sport harvests by residents of nonsubsistence areas, the remainder of the state, and nonresidents. Big game harvest data from ADF&G's Division of Wildlife Conservation's WinfoNet were aggregated by place of residence of hunters. Data from annual programs are not available for birds, small mammals, and wild plants, but these are unlikely to contribute a substantial portion of urban harvests (Fall 2013:159–160).

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Table 1.–Data availability for 2017 harvest estimates for census places and population, by census area and region.

Area	Number of census places: Total (adjusted)[3]	Data available (through 2017)	Data used for 2017 estimate[4]	% Represented	Population: Total (adjusted)[5]	Data used for 2017 estimate	% Represented[6]
Nome Census Area	16	13	13	81.3%	10,006	5,149	51.5%
North Slope Borough[1]	8	8	8	100.0%	7,675	7,248	94.4%
Northwest Arctic Borough	11	11	11	100.0%	7,541	7,482	99.2%
Arctic Region	**35**	**32**	**32**	91.4%	25,222	19,879	78.8%
Aniak Census Subarea	9	9	9	100.0%	1,443	1,390	96.3%
Denali Borough (portion)	1	1	1	100.0%	273	273	100.0%
Southeast Fairbanks Census Area (portion)	14	12	10	71.4%	2,473	1,793	72.5%
Yukon-Koyukuk Census Area	37	31	30	81.1%	5,351	4,231	79.1%
Interior Region	**61**	**53**	**50**	82.0%	9,540	7,687	80.6%
Kodiak Island Borough	**12**	**11**	**11**	91.7%	12,950	12,926	99.8%
Chugach Census Area (portion)	4	4	4	100.0%	2,685	2,685	100.0%
Cook Inlet (portion)[2]	12	12	12	100.0%	1,472	1,472	100.0%
Copper River Census Subarea	20	20	19	95.0%	2,765	2,604	94.2%
Denali Borough (portion)	1	1	1	100.0%	191	191	100.0%
Southcentral Region	**37**	**37**	**36**	97.3%	7,113	6,952	97.7%
Haines Borough	6	5	2	33.3%	2,459	1,942	79.0%
Hoonah-Angoon Census Area	9	9	9	100.0%	2,122	2,048	96.5%
Petersburg Borough	3	1	1	33.3%	3,147	2,896	92.0%
Prince of Wales-Hyder Census Area	16	16	16	100.0%	6,390	5,659	88.6%
Sitka Borough	1	1	1	100.0%	8,748	8,748	100.0%
Skagway Municipality	1	1	1	100.0%	1,087	1,087	100.0%
Wrangell Borough	1	1	1	100.0%	2,387	2,387	100.0%
Yakutat Borough	1	1	1	100.0%	552	552	100.0%
Southeast Region	**38**	**35**	**32**	84.2%	26,892	25,319	94.2%
Aleutians East Borough	6	6	6	100.0%	1,251	1,251	100.0%
Aleutians West Census Area	6	6	6	100.0%	2,849	2,849	100.0%
Bristol Bay Borough	3	3	3	100.0%	871	871	100.0%
Dillingham Census Area	10	9	9	90.0%	4,868	4,794	98.5%
Lake and Peninsula Borough	18	17	16	88.9%	1,684	1,665	98.9%
Southwest Region	**43**	**41**	**40**	93.0%	11,523	11,430	99.2%
Kusilvak Census Area	13	9	7	53.8%	8,208	4,366	53.2%
Lower Kuskokwim Census Subarea	25	13	11	44.0%	16,684	10,889	65.3%
Western Region	**38**	**22**	**18**	47.4%	24,892	15,255	61.3%
Rural State Total	**264**	**231**	**219**	83.0%	118,132	99,448	84.2%

1. Does not include the industrial enclave of Prudhoe Bay
2. Includes portions of Kenai Peninsula Borough and Matanuska-Susitna Borough
3. Adjusted count excludes military and industrial census designated places (CDPs)
4. Data sets for 8 census places were not used for 2017 harvest estimates because they have not been updated since the first statewide estimates were produced in 1987 (Wolfe and Walker 1987). These are Tanacross, Tetlin, and Huslia in the Interior Region; Chisana in Southcentral; and Nunapitchuk, Tununak, Kotlik, and Nunam Iqua in the Western Region. Ivanof Bay (Southwest Region) was not included due to uncertainties about the status of its population. Updated data for the Haines Borough only includes Haines and Mud Bay. Earlier estimates for Covenant Life CDP, Lutak, CDP, and Mosquito Lake CDP were not used for the 2017 update.
5. Adjusted population excludes those living in group quarters; also excludes "balance" of population of the Aleutians West Census Area, which consists primarily of the group quarters population in the former CDP of Shemya Station.
6. In some area, all communities are represented but not all the population, because a portion of the population lives in the unsurveyed "balance" of the census area.

Table 2.–Number of years since the last comprehensive survey was conducted for rural Alaska communities included in the 2017 harvest estimates.

Area	Number of communities represented	Number of years since last comprehensive survey			
		1 to 5 years	6 to 10 years	11 to 20 years	More than 20 years[1]
Nome Census Area	13	30.8%	15.4%	53.8%	0.0%
North Slope Borough	8	50.0%	37.5%	12.5%	0.0%
Northwest Arctic Borough	11	18.2%	45.5%	36.4%	0.0%
Arctic Region	**32**	31.3%	31.3%	37.5%	0.0%
Aniak Census Subarea	9	0.0%	88.9%	11.1%	0.0%
Denali Borough (portion)	1	100.0%	0.0%	0.0%	0.0%
Southeast Fairbanks Census Area (portic	10	50.0%	50.0%	0.0%	0.0%
Yukon-Koyukuk Census Area	30	33.3%	60.0%	3.3%	3.3%
Interior Region	**50**	32.0%	62.0%	4.0%	2.0%
Kodiak Island Borough	**11**	0.0%	0.0%	45.5%	54.5%
Chugach Census Area (portion)	4	75.0%	0.0%	0.0%	25.0%
Cook Inlet (portion)	12	50.0%	25.0%	8.3%	16.7%
Copper River Census Subarea	19	42.1%	57.9%	0.0%	0.0%
Denali Borough (portion)	1	0.0%	100.0%	0.0%	0.0%
Southcentral Region	**36**	47.2%	41.7%	2.8%	8.3%
Haines Borough	2	0.0%	100.0%	0.0%	0.0%
Hoonah-Angoon Census Area	9	11.1%	22.2%	0.0%	66.7%
Petersburg Borough	1	0.0%	0.0%	100.0%	0.0%
Prince of Wales-Hyder Census Area	16	0.0%	12.5%	37.5%	50.0%
Sitka Borough	1	100.0%	0.0%	0.0%	0.0%
Skagway Municipality	1	0.0%	0.0%	0.0%	100.0%
Wrangell Borough	1	0.0%	0.0%	100.0%	0.0%
Yakutat Borough	1	100.0%	0.0%	0.0%	0.0%
Southeast Region	**32**	9.4%	18.8%	25.0%	46.9%
Aleutians East Borough	6	50.0%	50.0%	0.0%	0.0%
Aleutians West Census Area	6	50.0%	0.0%	0.0%	50.0%
Bristol Bay Borough	3	0.0%	0.0%	100.0%	0.0%
Dillingham Census Area	9	0.0%	55.6%	33.3%	11.1%
Lake and Peninsula Borough	16	18.8%	6.3%	75.0%	0.0%
Southwest Region	**40**	22.5%	22.5%	45.0%	10.0%
Kusilvak Census Area	7	28.6%	71.4%	0.0%	0.0%
Lower Kuskokwim Census Subarea	11	27.3%	63.6%	9.1%	0.0%
Western Region	**18**	27.8%	66.7%	5.6%	0.0%
Rural State Total	**219**	27.4%	37.9%	21.5%	13.2%

1. For the 3 communities of the Aleutians West Census Area for which comprehensive harvest data are more than 20 years old (Unalaska. St. Paul, and St. George) more recent harvest estimates for key species (sea lion, salmon, and halibut for Unalaska; sea lion, fur seal, and halibut for St. George and St. Paul) were substituted for older values.

Table 3.–Estimated harvests of wild resources for home use in Alaska by census area, region, and category, 2017.

	Per capita harvest, pounds usable weight[5]							
Census Area[1]	Salmon	Other fish	Shellfish	Land mammals	Marine mammals	Birds and eggs	Wild plants	All resources
Nome Census Area	79.5	37.0	3.2	50.0	195.9	12.9	9.8	388.4
North Slope Borough[2]	12.4	52.0	0.1	149.0	226.6	10.9	1.7	452.6
Northwest Arctic Borough	47.8	127.2	1.7	133.3	44.1	7.7	8.8	370.7
Arctic Region	49.6	69.3	1.8	105.4	158.4	10.7	7.1	402.3
Aniak Census Subarea	189.3	44.8	0.0	50.4	0.7	4.2	14.6	304.1
Denali Borough (portion)	36.7	10.2	0.1	25.5	0.0	2.3	5.9	80.7
Southeast Fairbanks Census Area (portion)	76.3	36.6	0.3	110.8	0.0	6.4	13.0	243.6
Yukon-Koyukuk Census Area	159.0	45.1	0.1	103.3	0.0	10.1	6.6	324.1
Interior Region	138.6	41.8	0.1	95.0	0.1	8.0	9.5	293.3
Kodiak Island Borough	55.3	60.0	11.4	22.8	1.0	0.8	7.2	158.6
Chugach Census Area (portion)	47.1	19.7	3.8	37.0	3.5	1.6	9.9	122.6
Cook Inlet (portion)[3]	83.0	30.2	5.6	29.2	3.8	1.1	15.9	168.9
Copper River Census Subarea	92.3	13.7	1.2	41.7	0.0	1.0	7.8	157.6
Denali Borough (portion)	15.2	6.5	0.0	72.9	0.0	1.0	5.2	100.7
Southcentral Region	71.2	19.2	3.0	38.2	2.1	1.3	10.2	145.2
Haines Borough	46.6	37.8	11.9	28.2	0.0	0.9	10.0	135.3
Hoonah-Angoon Census Area	68.8	92.4	32.4	61.2	7.0	1.4	23.7	287.0
Petersburg Borough	60.2	42.2	37.1	17.3	0.0	0.6	3.9	161.3
Prince of Wales-Hyder Census Area	67.1	57.2	32.9	41.8	8.4	1.2	13.6	222.2
Sitka Borough	46.5	68.4	18.6	26.0	3.1	0.5	12.0	175.0
Skagway Municipality	17.7	15.5	9.0	3.6	0.0	0.4	2.0	48.1
Wrangell Borough	25.5	34.0	59.6	38.9	0.0	1.4	8.0	167.4
Yakutat Borough	92.6	47.0	11.7	49.4	32.6	4.0	24.6	261.9
Southeast Region	52.7	56.2	27.7	32.4	4.2	0.9	11.7	185.8
Aleutians East Borough	84.2	16.5	6.0	14.7	1.1	2.5	8.6	133.5
Aleutians West Census Area	14.2	38.0	4.7	11.2	5.3	1.2	5.6	80.2
Bristol Bay Borough	202.0	12.7	4.2	31.3	9.3	4.2	12.1	275.8
Dillingham Census Area	163.8	34.1	2.9	71.1	11.4	10.3	21.8	315.4
Lake and Peninsula Borough	257.5	33.7	9.8	77.3	9.5	7.5	15.0	410.2
Southwest Region	110.6	30.9	4.9	38.7	7.1	5.1	12.6	209.9
Kusilvak Census Area	125.1	68.8	0.2	75.5	39.5	14.9	9.9	333.9
Lower Kuskokwim Census Subarea	175.5	95.4	0.5	69.5	16.8	22.0	21.1	388.6
Western Region	158.9	86.6	0.4	71.5	24.3	19.7	17.4	378.7
Rural State Total	89.0	59.0	8.6	60.4	39.8	7.8	11.3	275.8
Anchorage Municipality	8.9	2.4	0.1	3.5	0.0			14.8
Kenai Peninsula Borough (portion)	16.6	8.1	0.4	6.9	0.0			32.0
Matanuska-Susitna Borough (portion)	10.1	2.5	0.1	9.4	0.0			22.1
Anchorage-Matsu-Kenai Nonsubsistence Area	10.1	3.1	0.1	5.2	0.0			18.6
Fairbanks Nonsubsistence Area[4]	7.1	1.3	0.1	7.9	0.0			16.4
Juneau Borough	7.6	5.1	0.4	7.7	0.0			20.9
Ketchikan Gateway Borough	10.2	7.7	0.7	7.1	0.3			26.0
Valdez	18.1	7.3	0.8	11.2	0.8			38.2
Urban State Total[5]	9.5	3.1	0.2	5.9	0.0			18.6
State Total	22.8	12.4	1.6	15.0	6.7	1.3	1.9	61.6

1. Census area populations used to calculate per capita harvests include residents of group quarters.
2. Does not include Prudhoe Bay CDP, which for this analysis is classified as a nonrural place. The Prudhoe Bay population was distributed proportionally to calculate urban per capita values.
3. Includes rural portions of Kenai Peninsula Borough and Matanuska-Susitna Borough.
4. Includes Fairbanks North Star Borough and portions of the Denali Borough and Southeast Fairbanks Census Area.
5. Harvest estimates for birds and eggs, and wild plants, are not available for urban places.