ESTIMATED HARVESTS OF FISH, WILDLIFE, AND WILD PLANT RESOURCES BY ALASKA REGION AND CENSUS AREAS, 2014

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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"). The most recent regional and statewide estimates were published in Fall 2016a (pertaining to 2012) and in *Subsistence in Alaska: A Year 2014 Update* (Fall 2016b). This short report provides additional detail about the harvest estimates summarized in the *2014 Update*, modeled after several tables that appear in Fall 2016a (Table 2, Table 3, Table 6).

ESTIMATING RURAL HARVESTS

Data used to estimate 2014 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 9 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). The data available for 215 rural census places represented 83.2% of Alaska's rural population and 81.4% 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 a majority of the population of all regions. (Comprehensive survey data were collected for 4 additional communities for study years 2015 or 2016, and will be included in future updates.)

As shown in Table 2, data for 51.2% of the communities upon which the harvest estimates are based represent study years from 2010 through 2014; for 19.1% of communities, data represent study years from 2005 through 2009; for 17.7%, data pertain to study years from 1995 through 2004; for the remaining 12.1% of communities, data pertain to study years more than 20 years before 2014. The Southeast Region had the largest portion of data sets more than 10 years old (77.2%). Most of the data sets used to estimate harvests for the Southcentral Region (86.1%), Western Region (83.3%), and Interior Region (70.5%) were based on study years from 2011 to 2014 (5 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 2014 were used as the demographic reference (ADLWD 2017). 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 (2014 population = 3,731 or 37.3% 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 28.1% of the harvests in smaller communities in the census area, based on the proportion of its 2004–2008 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 7.5% 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 2012–2014 average per capita harvests and 2014 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).

REFERENCES CITED

Alaska Department of Fish and Game. 1989. Alaska's Per Capita Harvests of Wild Foods. Alaska Fish and Game 21(6):14–15.

ADLWD, (Alaska Department of Labor and Workforce Development). 2017 Alaska Population Estimates. Alaska Department of Labor and Workforce Development. http://live.laborstats.alaska.gov/pop/index.cfm.

Fall, James A. 2013. Report on Proposed Changes to Nonsubsistence Areas. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 386, Anchorage. http://www.adfg.alaska.gov/techpap/TP386.pdf.

Fall, James A. 2016a Regional Patterns of Fish and Wildlife Harvests in Contemporary Alaska. Arctic 69(1):47–64.

Fall, James A. 2016. Subsistence in Alaska: A Year 2014 Update. Alaska Department of Fish and Game Division of Subsistence, Anchorage. http://www.adfg.alaska.gov/static/home/subsistence/pdfs/subsistence_update_2014.pdf.

Wolfe, Robert J., and Robert J. Walker. 1987. Subsistence Economies in Alaska: Productivity, Geography, and Development Impacts. Arctic Anthropology 24(2):56–81.

Table 1.–Data availability for 2014 harvest estimates for census places and population, by census area and region.

Area	Number of census places: Total (adjusted)[3]	Data available (through 2014)[4]	Data used for 2014 estimate[5]	% Represented	Population: Total (adjusted)[6]	Data used for 2014 estimate	% Represented[7]
Nome Census Area	16	13	13	81.3%	9,986	5,080	50.9%
North Slope Borough[1]	8	8	8	100.0%	7,565	7,138	94.4%
Northwest Arctic Borough	11	11	11	100.0%	7,491	7,432	99.2%
Arctic Region	**35**	**32**	**32**	91.4%	25,042	19,650	78.5%
Aniak Census Subarea	9	9	9	100.0%	1,522	1,470	96.6%
Denali Borough (portion)	1	1	1	100.0%	209	209	100.0%
Southeast Fairbanks Census Area (portion)	14	10	8	57.1%	2,533	1,649	65.1%
Yukon-Koyukuk Census Area	37	27	26	70.3%	5,514	3,649	66.2%
Interior Region	**61**	**47**	**44**	72.1%	9,778	6,977	71.4%
Kodiak Island Borough	**12**	**11**	**11**	91.7%	13,474	13,453	99.8%
Chugach Census Area (portion)	4	4	4	100.0%	2,684	2,684	100.0%
Cook Inlet (portion)[2]	12	12	12	100.0%	1,461	1,461	100.0%
Copper River Census Subarea	20	20	19	95.0%	2,866	2,720	94.9%
Denali Borough (portion)	1	1	1	100.0%	183	183	100.0%
Southcentral Region	**37**	**37**	**36**	97.3%	7,194	7,048	98.0%
Haines Borough	6	5	5	83.3%	2,551	2,412	94.6%
Hoonah-Angoon Census Area	9	9	9	100.0%	2,137	2,048	95.8%
Petersburg Borough	3	1	1	33.3%	3,222	2,975	92.3%
Prince of Wales-Hyder Census Area	16	16	16	100.0%	6,466	5,819	90.0%
Sitka Borough	1	1	1	100.0%	9,093	9,093	100.0%
Skagway Municipality	1	1	1	100.0%	1,035	1,035	100.0%
Wrangell Borough	1	1	1	100.0%	2,415	1,415	58.6%
Yakutat Borough	1	1	1	100.0%	634	634	100.0%
Southeast Region	**38**	**35**	**35**	92.1%	27,553	25,431	92.3%
Aleutians East Borough	6	5	5	83.3%	1,366	1,278	93.6%
Aleutians West Census Area	6	6	6	100.0%	3,107	3,017	97.1%
Bristol Bay Borough	3	3	3	100.0%	929	929	100.0%
Dillingham Census Area	10	9	9	90.0%	5,010	4,960	99.0%
Lake and Peninsula Borough	18	17	16	88.9%	1,645	1,619	98.4%
Southwest Region	**43**	**40**	**39**	90.7%	12,057	11,803	97.9%
Kusilvak Census Area	13	9	7	53.8%	8,083	4,375	54.1%
Lower Kuskokwim Census Subarea	25	13	11	44.0%	16,536	10,917	66.0%
Western Region	**38**	**22**	**18**	47.4%	24,619	15,292	62.1%
Rural State Total	**264**	**224**	**215**	81.4%	119,717	99,654	83.2%

1. Not not include 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. Does not include four communities surveyed for the first time for 2015 or 2016 (Central, Cold Bay, Four Mile Round CDP, and Nenana).

5. Data sets for 8 census places in used for 2014 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.

6. 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.

7. 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 2014 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%	69.2%		
North Slope Borough	8	87.5%		12.5%	
Northwest Arctic Borough	11	63.6%	27.3%	9.1%	
Arctic Region	**32**	56.3%	37.5%	6.3%	0.0%
Aniak Census Subarea	9		100.0%		
Denali Borough (portion)	1				100.0%
Southeast Fairbanks Census Area (portic	8	100.0%			
Yukon-Koyukuk Census Area	26	88.5%		3.8%	7.7%
Interior Region	**44**	70.5%	20.5%	2.3%	6.8%
					0.0%
Kodiak Island Borough	**11**	0.0%	0.0%	45.5%	54.5%
					0.0%
Chugach Census Area (portion)	4	75.0%			25.0%
Cook Inlet (portion)	12	75.0%	8.3%		16.7%
Copper River Census Subarea	19	94.7%	5.3%		
Denali Borough (portion)	1	100.0%			
Southcentral Region	**36**	86.1%	5.6%	0.0%	8.3%
Haines Borough	5	40.0%		60.0%	
Hoonah-Angoon Census Area	9	33.3%		22.2%	44.4%
Petersburg Borough	1			100.0%	
Prince of Wales-Hyder Census Area	16	12.5%		68.8%	18.8%
Sitka Borough	1	100.0%			
Skagway Municipality	1				100.0%
Wrangell Borough	1			100.0%	
Yakutat Borough	1			100.0%	
Southeast Region	**35**	22.9%	0.0%	54.3%	22.9%
Aleutians East Borough	5		60.0%		40.0%
Aleutians West Census Area	6	50.0%			50.0%
Bristol Bay Borough	3		100.0%		
Dillingham Census Area	9	11.1%	66.7%	11.1%	11.1%
Lake and Peninsula Borough	16	18.8%	25.0%	56.3%	
Southwest Region	**39**	17.9%	41.0%	25.6%	15.4%
Kusilvak Census Area	7	71.4%	28.6%		
Lower Kuskokwim Census Subarea	11	90.9%		9.1%	
Western Region	**18**	83.3%	11.1%	5.6%	0.0%
Rural State Total	**215**	51.2%	19.1%	17.7%	12.1%

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, 2014.

	Per capita harvest, pounds usable weight[4]							
Census Area	Salmon	Other fish	Shellfish	Land mammals	Marine mammals	Birds and eggs	Wild plants	All resources
Nome Census Area	66.6	41.6	2.7	56.5	197.5	18.3	15.7	398.9
North Slope Borough[1]	12.2	52.1	0.1	147.9	225.7	10.7	1.6	450.4
Northwest Arctic Borough	47.5	127.3	1.7	132.4	43.6	7.7	8.8	368.8
Arctic Region	44.5	71.1	1.6	107.1	158.5	12.8	9.3	405.0
Aniak Census Subarea	189.2	44.8	0.0	50.4	0.8	4.2	14.4	303.7
Denali Borough (portion)	87.1	13.1	3.6	29.7	0.0	3.5	2.3	139.2
Southeast Fairbanks Census Area (portion)	47.2	37.6	0.4	112.4	0.0	6.7	13.8	218.1
Yukon-Koyukuk Census Area	176.8	52.3	0.0	127.3	0.0	9.9	6.6	372.9
Interior Region	143.3	46.5	0.2	109.4	0.1	8.0	9.6	317.0
Kodiak Island Borough	55.2	60.0	11.3	22.8	1.0	0.8	7.2	158.3
Chugach Census Area (portion)	46.8	19.6	3.7	37.1	3.6	1.6	9.9	122.4
Cook Inlet (portion)[2]	79.1	29.6	5.4	30.9	3.5	1.2	16.1	165.8
Copper River Census Subarea	92.4	13.6	1.1	41.7	0.0	1.0	7.8	157.7
Denali Borough (portion)	15.2	6.5	0.0	72.9	0.0	1.0	5.2	100.7
Southcentral Region	70.7	18.9	2.9	38.6	2.1	1.3	10.2	144.7
Haines Borough	46.6	37.8	11.9	30.6	0.0	0.9	10.0	137.8
Hoonah-Angoon Census Area	67.8	92.6	32.6	61.2	7.2	1.4	24.0	286.8
Petersburg Borough	60.2	42.2	37.1	17.3	0.0	0.6	3.9	161.3
Prince of Wales-Hyder Census Area	67.2	57.4	33.0	41.7	8.3	1.2	13.7	222.6
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	145.5	87.0	54.3	33.8	34.7	2.9	27.4	385.5
Southeast Region	54.0	57.2	28.7	32.3	4.3	0.9	11.8	189.2
Aleutians East Borough	63.7	22.8	8.4	15.2	2.1	3.6	4.1	119.8
Aleutians West Census Area	15.4	38.6	4.8	12.0	6.0	1.3	5.8	83.9
Bristol Bay Borough	203.0	12.6	4.2	31.2	9.2	4.3	12.0	276.5
Dillingham Census Area	165.4	34.3	2.9	71.3	11.0	10.1	21.5	316.5
Lake and Peninsula Borough	256.7	32.7	9.2	75.6	9.6	7.4	14.7	406.0
Southwest Region	105.8	32.3	5.3	38.4	7.3	5.2	11.6	205.8
Kusilvak Census Area	125.6	68.3	0.2	75.7	39.2	14.5	9.8	333.3
Lower Kuskokwim Census Subarea	172.5	88.7	0.1	68.4	16.4	21.7	20.7	388.6
Western Region	157.1	82.0	0.1	70.8	23.9	19.4	17.2	370.4
Rural State Total	87.3	58.9	8.8	61.2	39.1	8.1	11.6	275.0
Anchorage Municipality	9.1	2.4	0.1	3.6	0.0			15.3
Kenai Peninsula Borough (portion)	18.0	8.8	0.5	7.5	0.0			34.8
Matanuska-Susitna Borough (portion)	10.2	2.5	0.1	9.6	0.0			22.4
Anchorage-Matsu-Kenai Nonsubsistence Area	10.5	3.3	5.4	0.0	0.1			19.3
Fairbanks Nonsubsistence Area[3]	7.1	1.3	0.1	8.0	0.0			16.4
Juneau Borough	6.8	4.6	0.4	6.9	0.0			18.6
Ketchikan Gateway Borough	12.4	9.4	0.9	8.7	0.3			31.8
Prudhoe Bay	9.8	3.1	0.2	6.0	0.0			19.1
Valdez	14.7	5.9	0.6	9.0	0.6			30.9
Urban State Total[4]	9.8	3.1	0.2	6.0	0.0			19.1
State Total[5]	22.9	12.6	1.6	15.3	6.6	1.4	2.0	62.3

1. Does not include Prudhoe Bay CDP, which for this analysis is classified as a nonrural place.

2. Includes rural portions of Kenai Peninsula Borough and Matanuska-Susitna Borough.

3. Includes Fairbanks North Star Borough and portions of the Denali Borough and Southeast Fairbanks Census Area.

4. Harvest estimates for birds and eggs, and wild plants, are not available for urban places.

5. Due to population adjustment, differs slightly from Alaska total in Figure 6 in Fall 2016