Customary and Traditional Use Worksheet and Options for Amounts Reasonably Necessary for Subsistence Uses of Grouses in Game Management Unit 18

Prepared by
Hiroko Ikuta and Jeff Park
for the January 2014 Kotzebue Board of Game meeting
Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the reports by the Division of Subsistence. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

### Weights and measures (metric)
- centimeter cm
- deciliter dL
- gram g
- hectare ha
- kilogram kg
- kilometer km
- liter L
- meter m
- milliliter mL
- millimeter mm

### Weights and measures (English)
- cubic feet per second ft³/s
- foot ft
- gallon gal
- inch in
- mile mi
- nautical mile nmi
- ounce oz
- pound lb
- quart qt
- yard yd

### Time and temperature
- day d
- degree Celsius °C
- degree Fahrenheit °F
- degree kelvin K
- hour h
- minute min
- second s

### Physics and chemistry
- alternating current AC
- ampere A
- calorie cal
- direct current DC
- hertz Hz
- horsepower hp
- hydrogen ion activity (negative log of) pH
- parts per million ppm
- parts per thousand ppt, %
- volts V
- watts W

### General
- all commonly-accepted abbreviations e.g., Mr., Mrs., Sr., pm, etc.
- all commonly-accepted professional titles e.g., Dr., Ph.D., R.N., etc.
- Alaska Administrative Code AAC
- compass directions: east E, north N, south S, west W
- copyright ©
- corporate suffixes:
  - Company Co.
  - Corporation Corp.
  - Incorporated Inc.
  - Limited Ltd.
- District of Columbia D.C.
- et alii (and others) et al.
- exempli gratia (for example) e.g.
- Federal Information Code FIC
- i.e., id est (that is)
- latitude or longitude lat. or long.
- monetary symbols (U.S.) $, ¢
- months (tables and figures): first three letters (Jan., Feb., Dec.)
- registered trademark ®
- trademark ™
- United States (adjective) U.S.
- United States of America (noun) USA
- U.S. United States Code
- U.S. state use two-letter abbreviations (e.g., AK, WA)

### Measures (fisheries)
- fork length FL
- mideye-to-fork MEF
- mideye-to-tail-fork METF
- standard length SL
- total length TL

### Mathematics, statistics
- all standard mathematical signs, symbols
- and abbreviations
- alternate hypothesis \( H_A \)
- base of natural logarithm \( e \)
- catch per unit effort CPUE
- coefficient of variation CV
- common test statistics \( F, t, \chi^2, \text{etc.} \)
- confidence interval CI
- correlation coefficient (multiple) R
- correlation coefficient (simple) r
- covariance cov
- degree (angular) °
- degrees of freedom df
- expected value E
- greater than >
- greater than or equal to ≥
- harvest per unit effort HPUE
- less than <
- less than or equal to ≤
- logarithm (natural) ln
- logarithm (base 10) log
- logarithm (specify base) \( \log_b \), etc.
- minute (angular) '
- not significant NS
- null hypothesis \( H_0 \)
- percent %
- probability P
- probability of a type I error (rejection of the null hypothesis when true) \( \alpha \)
- probability of a type II error (acceptance of the null hypothesis when false) \( \beta \)
- second (angular) "
- standard deviation SD
- standard error SE
- variance
  - population Var
  - sample var
Customary and Traditional Use Worksheet and Options for Amounts Reasonably Necessary for Subsistence Uses of Grouses in Game Management Unit 18

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ABSTRACT

This report provides a description of the customary and traditional uses of grouses in Game Management Unit (GMU) 18. It also provides options for amounts reasonably necessary for subsistence (ANS) for consideration by the Alaska Board of Game (BOG) should it make a positive customary and traditional use finding for grouses.

Key words: Subsistence, amount necessary for subsistence, customary and traditional uses, Yukon-Kuskokwim Delta, grouse, Board of Game.

INTRODUCTION

This report has been prepared for the Alaska Board of Game (BOG) for reference when considering Proposal 12, which has implications for subsistence hunting for grouses in Game Management Unit (GMU) 18, during its January 2014 meeting (Figure 1). Under AS 16.05.258(a), the BOG is charged with identifying game populations, or portions of populations, that “are customarily taken or used for subsistence” (a “C&T finding”). If a portion of these populations can be harvested consistent with sustained yield principles, the BOG “shall determine the amount of the harvestable portion that is reasonably necessary for subsistence uses” (AS 16.05.258(b)). This is called the amount reasonably necessary for subsistence, or an “ANS finding.” The proposal provides an opportunity for the BOG and public to determine C&T and ANS findings for grouses in GMU 18.

THE EIGHT CRITERIA

CRITERION 1: LENGTH AND CONSISTENCY OF USE

A long-term consistent pattern of noncommercial taking, use, and reliance on the fish stock or game population that has been established over a reasonable period of time of not less than one generation, excluding interruption by circumstances beyond the user’s control, such as unavailability of the fish or game caused by migratory patterns.

Grouses have a long history in the diets of Western Alaska residents. According to Division of Subsistence comprehensive surveys, ruffed grouse *Bonasa umbellus*, sharp-tailed grouse *Tympanuchus phasianellus*, and spruce grouse *Falcipennis canadensis* have been harvested for many generations (Brown et al. 2012; Brown et al. 2013; Brown et al. In prep1; Fall et al. 2012; Ikuta, Brown, and Koster In prep2; Ikuta, Runfola, Koster In prep3).

In the Central Yup’ik language, ruffed grouse are called *egelruciayuli* or *elciayuli*, while spruce grouse are *egtuk*. Grouses are easier birds to catch than waterfowl. Today, they remain an important food source in spring and fall. Information about subsistence harvests and uses of grouses in GMU 18 from 1998–2012 is presented in Table 1. In addition, a regulatory history and present hunting regulations for grouses in GMU 18 are presented in Appendix A.

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CRITERION 2: SEASONALITY
A pattern of taking or use recurring in specific seasons of each year.

Grouses are available year-round, yet people harvest them primarily in spring and fall. A man who has been living in Bethel since 1996 said, “We’ll shoot a lot of spruce grouse. We’ll shoot them during moose hunting season” (Key respondent, personal communication with Jeff Park, ADF&G Subsistence Resource Specialist, April 8, 2013).

CRITERION 3: MEANS AND METHODS OF HARVEST
A pattern of taking or use consisting of methods and means of harvest that are characterized by efficiency and economy of effort and cost.

Historically, people in Western Alaska harvested grouses by using snares, nets, and decoys. Today, instead of using snares and nets, many hunters harvest grouses with shotguns and .22 caliber rifles.

CRITERION 4: GEOGRAPHIC AREAS
The area in which the noncommercial, long-term, and consistent pattern of taking, use, and reliance upon the fish stock and game population has been established.

Areas closest to communities are most heavily used, but grouses are harvested opportunistically by hunters or trappers traveling throughout community harvest areas in upland areas.

Ruffed grouse occur naturally throughout most of Interior Alaska in aspen forests in the Yukon, Tanana, and Kuskokwim river valleys. They are most abundant where dense stands of young aspen or birch have become established after a fire or timber harvest. Sharp-tailed grouse can often be found perched high in a spruce tree, or emerging from dense brush along a back road. Spruce grouse inhabit white spruce and paper birch woodlands, and black spruce bogs.4

CRITERION 5: MEANS OF HANDLING, PREPARING, PRESERVING, AND STORING
A means of handling, preparing, preserving, and storing fish or game that has been traditionally used by past generations, but not excluding recent technological advances where appropriate.

Grouses and their eggs are primarily used as food for human consumption. Now as in the past, most grouses are eaten fresh or frozen for later use. Freezing has been a common preservation technique. Occasionally, a grouse is dried whole. Often grouses are boiled or roasted without being eviscerated. Currently, some people store frozen grouses in electric freezers, but it is not uncommon to store grouses in storm sheds for a few days or weeks at a time prior to consumption.

CRITERION 6: INTERGENERATIONAL TRANSMISSION OF KNOWLEDGE, SKILLS, VALUES, AND LORE
A pattern of taking or use that includes the handing down of knowledge of fishing or hunting skills, values, and lore from generation to generation.

Traditionally, young boys in Western Alaska learned how to hunt by living with other men of the community in the ceremonial men’s house (qargiq). Today, the institution of qargiq is no longer part of Central Yup’ik daily life. Yet, hunting knowledge is still passed on from grandfather, father, or uncle to

children. A middle-aged man in Bethel said, “They’ve [children] all shot spruce grouse. Even my 7-year-old [daughter], she’ll take a .22 and go knock one down … Making sure you’ll get some food when you get older” (Key respondent, personal communication with Jeff Park, ADF&G Subsistence Resource Specialist, April 8, 2013).

Yup’ik children are expected to learn by observing experienced hunters—such as fathers, uncles, and grandfathers—who know the hunting equipment and techniques, animal behaviors, anatomy, geography, and weather, and then by participating in the actual tasks with them.

**CRITERION 7: DISTRIBUTION AND EXCHANGE**

A pattern of taking, use, and reliance where the harvest effort or products of that harvest are distributed or shared, including customary trade, barter, and gift-giving.

In every community in Western Alaska where Division of Subsistence has conducted studies, researchers have found extensive sharing and distribution of wild resources (Brown et al. 2012; Brown et al. 2013; Brown et al. In prep; Fall et al. 2012; Ikuta, Brown, and Koster In prep; Ikuta, Runfola, and Koster In prep). Sharing typically involves almost every household in the study samples. Certain resources, such as seal oil, are more commonly shared than others, which is as true in the present as it was in the past. Certain communities are recognized as particularly good sources for certain resources; for example, Lower Yukon River villages are recognized for their higher moose harvests in more recent times.

Some sharing occurs ceremonially: in feasts at Thanksgiving, Christmas, Easter, funerals, or on the occasion of a child’s first kill. Table 1 lists the percentage of households in selected GMU 18 communities using, harvesting, giving, and receiving grouses, and serves to document the extent of sharing of this particular resource from 1998–2012. Every community that reported harvesting grouses also reported giving and receiving this resource. In most communities, households use wild foods harvested by others through sharing networks, so the percentages of households harvesting usually are lower than the percentage of households using wild foods.

In addition, the extra subsistence foods local people produce are usually shared with elderly residents, single mothers with young, dependent children, and young single persons or couples who are just getting started. Sharing subsistence-caught wildlife is a fundamental characteristic of communities that follow a subsistence way of life in the region resources (Brown et al. 2012; Brown et al. 2013; Brown et al. In prep; Fall et al. 2012; Ikuta, Brown, and Koster In prep; Ikuta, Runfola, and Koster In prep).

**CRITERION 8: DIVERSITY OF RESOURCES IN AN AREA; ECONOMIC, CULTURAL, SOCIAL, AND NUTRITIONAL ELEMENTS**

A pattern that includes taking, use, and reliance for subsistence purposes upon a wide variety of fish and game resources and that provides substantial economic, cultural, social, and nutritional elements of the subsistence way of life.

A number of recent studies have demonstrated that Western Alaskan communities take, use, and rely upon a wide diversity of fish and game resources resources (Brown et al. 2012; Brown et al. 2013; Brown et al. In prep; Fall et al. 2012; Ikuta, Brown, and Koster In prep; Ikuta, Runfola, and Koster In prep). Documented harvests ranged from 434 lb per capita in Lower Kuskokwim communities to 269 lb per capita in Central Kuskokwim communities in 2009–2013. The typical community harvests approximately 50 different species of plants, fish, and wildlife each year. The mix of species depends upon species availability. For some coastal communities, as much as 80% of the total harvest by weight may come from marine mammals. For other communities, terrestrial mammals, fish, and marine mammals compose approximately equal portions of the total community harvests.

Many people in these communities cannot afford to buy meat or fish, and wild foods are essential to the quality of their diet. The people of GMU 18 use and rely upon virtually all the edible wild game species
available in their region. These households use cash income to purchase fuel oil, electricity, and family goods, including clothing and shelter. They also use cash to purchase equipment used in subsistence activities. However, the amount of cash available in most Western communities is relatively small compared to urban parts of Alaska. According to the U.S. Census Bureau\(^5\), the median household income is $52,063 in the Bethel census area and $39,583 in the Wade Hampton census area, while the median in the state of Alaska is $69,014. At the same time, imported food costs are very high.

The harvesting of wild foods continues a long cultural tradition for many people—a tradition which continues to evolve in many ways as social, economic, and environmental conditions change.

**ANS OPTIONS**

Followings are 4 options for the BOG to consider in making an ANS finding during its January 2014 meeting. The options presented below were developed using harvest data from the survey program of the Alaska Migratory Bird Co-Management Council (AMBCC) (Naves 2010a; Naves 2010b; Naves 2011; Naves 2012). While the data from comprehensive surveys present harvest estimates at the community level (Table 1), the AMBCC program reports harvest estimates at the subregional and regional levels (Table 2).

The AMBCC program is an annual survey program that develops area estimates based on a sample of communities. In the AMBCC program, villages and regions are surveyed on a rotating schedule, which is adjusted yearly according to monitoring priorities and funding availability. Communities in GMU 18 were surveyed in 2004–2007 and 2009–2011.

**OPTION A: 100–5,100 grouses (all species combined, rounded)**

Option A is based on the low and high range (84–5,094 birds) of the annual estimated harvests in GMU 18, 2004–2007 and 2009–2011.

**OPTION B: 100–2,900 grouses (all species combined, rounded)**

Option B is plus and minus (±) one standard deviation around the average annual estimated harvests in GMU 18, 2004–2007 and 2009–2011 (84–2,856 birds). Standard deviation is a measure of variability in the data. Based upon the estimates, repeated sampling should give a result between –1 and +1 standard deviation from the mean 68% of the time. Because the (–) standard deviation would be less than zero, the lower bound is equal to the lowest harvest year instead.

**OPTION C: 100–3,900 grouses (all species combined, rounded)**

Option C is based on the high 95% confidence interval value (CI) for the lowest estimated harvest year, to the low 95% CI value for the highest estimated harvest year, GMU 18, 2004–2007 and 2009–2011 (127–3,888 birds).

**OPTION D: 50–6,300 grouses (all species combined, rounded)**

Option D is based on the low 95% CI value for the lowest estimated harvest year, to the high 95% CI value for the highest estimated harvest year in GMU 18, 2004–2007 and 2009–2011 (42–6,300 birds).

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Figure 1.—Map of Game Management Unit 18.
Table 1.–Subsistence harvests and uses of grouses in 13 communities in GMU 18, 1998–2012.

<table>
<thead>
<tr>
<th>Community</th>
<th>Study year</th>
<th>Use</th>
<th>Attempting harvest</th>
<th>Harvesting</th>
<th>Receiving</th>
<th>Giving</th>
<th>Percentage of households</th>
<th>Estimated harvest</th>
<th>95% CI (±)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akiachak</td>
<td>1998</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>5%</td>
<td>11%</td>
<td></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Akiak</td>
<td>2010</td>
<td>22%</td>
<td>21%</td>
<td>21%</td>
<td>2%</td>
<td>10%</td>
<td></td>
<td>0.7</td>
<td>0.2</td>
</tr>
<tr>
<td>Bethel</td>
<td>2012</td>
<td>4%</td>
<td>3%</td>
<td>3%</td>
<td>1%</td>
<td>1%</td>
<td></td>
<td>0.5</td>
<td>0.1</td>
</tr>
<tr>
<td>Emmonak</td>
<td>2008</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
<td>1%</td>
<td>1%</td>
<td></td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Kwethluk</td>
<td>1986</td>
<td>unknown</td>
<td>14%</td>
<td>14%</td>
<td>3%</td>
<td>3%</td>
<td></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Kwethluk</td>
<td>2010</td>
<td>4%</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lower Kalskag</td>
<td>2009</td>
<td>44%</td>
<td>41%</td>
<td>38%</td>
<td>10%</td>
<td>14%</td>
<td></td>
<td>2.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Marshall</td>
<td>2009</td>
<td>13%</td>
<td>9%</td>
<td>9%</td>
<td>7%</td>
<td>4%</td>
<td></td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Mountain Village</td>
<td>2009</td>
<td>5%</td>
<td>4%</td>
<td>4%</td>
<td>3%</td>
<td>2%</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Napakiak</td>
<td>2011</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Napaskiak</td>
<td>2011</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>0%</td>
<td>0%</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Oscarnville</td>
<td>2010</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Russian Mission</td>
<td>2011</td>
<td>52%</td>
<td>52%</td>
<td>52%</td>
<td>9%</td>
<td>11%</td>
<td></td>
<td>8.2</td>
<td>1.6</td>
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<td>Tuluksak</td>
<td>2010</td>
<td>31%</td>
<td>29%</td>
<td>28%</td>
<td>7%</td>
<td>12%</td>
<td></td>
<td>1.4</td>
<td>0.3</td>
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<tr>
<td>Upper Kalskag</td>
<td>2009</td>
<td>60%</td>
<td>50%</td>
<td>48%</td>
<td>17%</td>
<td>23%</td>
<td></td>
<td>3.8</td>
<td>1.1</td>
</tr>
</tbody>
</table>


Table 2.–Subsistence harvests in GMU 18 communities, by subregion, 2004–2011.

<table>
<thead>
<tr>
<th>Subregion</th>
<th>2004 (±)</th>
<th>2005 (±)</th>
<th>2006 (±)</th>
<th>2007 (±)</th>
<th>2008 (±)</th>
<th>2009 (±)</th>
<th>2010 (±)</th>
<th>2011 (±)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid coast</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>North coast</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lower Yukon</td>
<td>65 22–108</td>
<td>16 2–30</td>
<td>307 158–456</td>
<td>30 18–43</td>
<td>164 164–164</td>
<td>2,265 1,551–2,979</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bethel</td>
<td>0 163 0–358</td>
<td>4 1–7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Sources (Naves 2010a; Naves 2010b; Naves 2011; Naves 2012)

Note: The Central Kuskokwin subregion falls outside GMU 18 and was therefore omitted from these calculations.
REFERENCES CITED


Appendix A: Grouse Regulatory History, 1925–2013 in GMU 18
<table>
<thead>
<tr>
<th>Regulatory year</th>
<th>Season</th>
<th>Total days</th>
<th>Bag limits, areas, and conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1925–1932</td>
<td>Sept. 1 – Feb. 28</td>
<td>181</td>
<td>In any one day during the open season 15 grouse in the aggregate of all kinds; but not to exceed 25 in the aggregate of all kinds of grouse and ptarmigan.</td>
</tr>
<tr>
<td>1933–1939</td>
<td>Sept. 1 – Feb. 28</td>
<td>181</td>
<td>15 grouse, 25 ptarmigan, a day but not more than 25 in aggregate a day.</td>
</tr>
<tr>
<td>1940</td>
<td>Aug. 20 – Jan. 31</td>
<td>165</td>
<td>Grouse 10; ptarmigan 15, but not to exceed 15 in the aggregate of all kind of grouse and ptarmigan a day.</td>
</tr>
<tr>
<td>1941–1942</td>
<td>Aug. 20 – Jan.31</td>
<td>165</td>
<td>Grouse 10; ptarmigan 10, but not to exceed 10 in the aggregate of all kind of grouse and ptarmigan a day.</td>
</tr>
<tr>
<td>1943</td>
<td>Sept. 1 – Jan. 31</td>
<td>153</td>
<td>Grouse 10; ptarmigan 10, but not to exceed 10 in the aggregate of all kind of grouse and ptarmigan a day.</td>
</tr>
<tr>
<td>1944</td>
<td>Fur District 5</td>
<td>167</td>
<td>Grouse 10; ptarmigan 10, but not to exceed 10 in the aggregate of all kind of grouse and ptarmigan a day.</td>
</tr>
<tr>
<td>1945–1946</td>
<td>Fur District 5</td>
<td>181</td>
<td>Grouse 10; ptarmigan 10, but not to exceed 10 in the aggregate of all kind of grouse and ptarmigan a day.</td>
</tr>
<tr>
<td>1947–1948</td>
<td>Fur District 5</td>
<td>193</td>
<td>Grouse 10; ptarmigan 10, but not to exceed 10 in the aggregate of all kind of grouse and ptarmigan a day.</td>
</tr>
<tr>
<td>1949–1951</td>
<td>In the Territory</td>
<td>181</td>
<td>10 singly or in the aggregate of all kinds of grouse or ptarmigan in a day.</td>
</tr>
<tr>
<td>1952</td>
<td>In the Territory</td>
<td>193</td>
<td>10 singly or in the aggregate of all kinds of grouse or ptarmigan in a day.</td>
</tr>
<tr>
<td>1953</td>
<td>In the Territory</td>
<td>239</td>
<td>10 singly or in the aggregate of all kinds of grouse or ptarmigan in a day.</td>
</tr>
<tr>
<td>1954</td>
<td>North of the Alaska Range</td>
<td>239</td>
<td>15 a day in the aggregate of all kinds of grouse and ptarmigan, of which not more than 10 shall be grouse.</td>
</tr>
<tr>
<td>1955</td>
<td>North of the Alaska Range</td>
<td>239</td>
<td>10 grouse a day.</td>
</tr>
<tr>
<td>1956–1959</td>
<td>GMU 18</td>
<td>239</td>
<td>10 grouse a day.</td>
</tr>
<tr>
<td>1960–1961</td>
<td>GMU 18</td>
<td>208</td>
<td>15 grouse a day.</td>
</tr>
<tr>
<td>1962–1964</td>
<td>GMU 18</td>
<td>218</td>
<td>15 grouse a day.</td>
</tr>
<tr>
<td>1965–1967</td>
<td>GMU 18</td>
<td>208</td>
<td>15 grouse a day. 30 in possession.</td>
</tr>
<tr>
<td>1968–2013</td>
<td>GMU 18</td>
<td>218</td>
<td>15 grouse a day. 30 in possession.</td>
</tr>
</tbody>
</table>