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Amounts Reasonably Necessary for Subsistence
Updated October 2021

Introduction

Alaska Statute 16.05.258(b) requires that the Board of Fisheries and the Board of Game "determine the amount of the harvestable portion (of each fish stock and game population with customary and traditional uses) that is reasonably necessary for subsistence uses." This is called an "ANS [amount reasonably necessary for subsistence] finding." The ANS finding requirement was first included in statute in 1986, with the present statutory language adopted in 1992. ANS findings appear within subsistence hunting and fishing regulations.

Alaska Statute 16.05.258 *Subsistence Use and Allocation of Fish and Game* sets out the following steps for each board to follow to provide for subsistence hunting and fishing opportunities.

> Step One. Each board identifies the fish stocks and game populations, or portions of stocks or populations, that are customarily and traditionally taken or used for subsistence. The statute states that "the commissioner [of the Department of Fish and Game] shall provide recommendations to the boards concerning the stock and population identifications" [AS 16.05.258(a)].
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> Step Two. The appropriate board determines whether a portion of a fish stock or game population with customary and traditional uses can be harvested consistent with sustained yield.
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> Step Three. If a portion of the stock or population can be harvested consistent with sustained yield, the board determines the amount of the harvestable portion that is reasonably necessary for subsistence uses.
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> Step Four. If the harvestable surplus is equal to or greater than the ANS (when ANS is established as a range, this is the lower end of the range), the appropriate board adopts regulations that "provide a reasonable opportunity for subsistence uses of those stocks or populations." Reasonable opportunity is defined in statute as "An opportunity, as determined by the appropriate board, that allows a subsistence user to participate in a subsistence hunt or fishery that provides a normally diligent participant with a reasonable expectation of success of taking of fish or game" [AS 16.05.258(f)].

If the harvestable surplus is above the ANS (the upper end of the range when an ANS range is established), the boards may adopt regulations providing for other uses of the stock or population (commercial, sport, and/or personal use harvests). If the harvestable surplus is below the ANS, the board must restrict participation in the subsistence hunt or fishery by applying the factors listed in AS16.05.258(b)(4)(B). This is called a "Tier II" situation.

It is important to remember that ANS findings are made by the Board of Fisheries and the Board of Game, not ADF&G. ADF&G, as staff to the boards, provides background information and develops options for ANS findings. Because ANS findings are allocations, ADF&G takes no position on the findings. ADF&G's obligation is to provide best available information and offer options. A goal is to build a good administrative record and to be clear about any data gaps, limitations, or assumptions within the ANS options. The final ANS decision is each board's and may diverge from the options presented by the department and be based on factors not presented by the department in the options.

Another key point to remember is that ANS findings are tools for evaluating subsistence regulations to determine if reasonable opportunities are being provided for subsistence (customary and traditional) uses. Subsistence regulations can be re-examined if subsistence harvests consistently fall below the ANS. This may indicate that regulations are not providing a reasonable opportunity, or that characteristics of the stock or population have changed, or that the ANS needs adjusting due to changing use patterns, for example.

History of ANS Findings

After the passage of the revised state subsistence statute in 1992, each board followed a slightly different procedure to comply with the new provisions, including the ANS determinations.

The Board of Game scheduled a "subsistence consistency review" meeting in Fairbanks on November 9–19, 1992. The intent was to review all existing regulations for wildlife populations for which the board had already made a positive C&T finding for consistency with the revised statute, including making ANS determinations. The department prepared C&T worksheets for all game populations with existing findings. The department also prepared a set of 62 "Subsistence Regulation Review Sheets," one for each game population, which guided board deliberations with information organized around a set of 8 topics. Each topic included background, an ADF&G recommendation, and a board decision. These topics were:

1. Is this population in a nonsubsistence area?
2. Is this population customarily and traditionally taken or used for subsistence?
3. Can a portion of the population be harvested consistent with sustained yield?
4. What amount is reasonably necessary for subsistence uses?
5. Do the proposed regulations provide a reasonable opportunity for subsistence uses?
6. Is it necessary to reduce or eliminate other uses to provide a reasonable opportunity for subsistence uses?
7. Does the adoption of regulations reducing or eliminating consumptive uses other than subsistence uses provide a reasonable opportunity for subsistence uses?
8. Other regulations requiring action.

The Board of Game did not finish its work in November 1992 and reconvened in Anchorage in February 1993 to complete the ANS findings for the populations with positive C&T uses. Since then, the Board of Game has made additional C&T findings and adopted ANS findings for these populations. The board has also reviewed and revised previous ANS findings. All Board of

Game C&T findings and ANS findings appear together in the codified regulations: 5 AAC 99.025 *Customary and Traditional Uses of Game Populations*.

Unlike the Board of Game, the Board of Fisheries did not attempt to address compliance with the 1992 subsistence statute in a single meeting. Rather, the Board of Fisheries reviewed existing subsistence regulations for compliance with the 1992 statute during its regularly scheduled meetings. At these meetings, the Board made ANS determinations for stocks with positive C&T findings. These meetings were:

November 1992	Cook Inlet Area
January 1993	Kodiak and Chignik Areas
February 1993	Bristol Bay Management Area, Bering Sea Management Area (shellfish), Alaska Peninsula Management Area, Aleutian Islands Management Area, Kodiak Management Area (shellfish), Cook Inlet Management Area (shellfish), Prince William Sound Management Area
1993	Southeast and Yakutat
1993	Yukon
1993	Kuskokwim
1993	Northwest

ADF&G prepared a set of C&T worksheets as background for these Board of Fisheries meetings as well as "consistency review worksheets" with ANS recommendations. Originally, the Board of Fisheries made "administrative" ANS findings only, and, in contrast to the Board of Game, did not adopt the ANS findings as regulations. Beginning in approximately 1999, the Board of Fisheries began adopting the ANS findings in regulation and has been doing so as the opportunity arises during its scheduled meetings. Finfish and shellfish C&T and ANS findings appear in the subsistence regulations for each fisheries management area.

Questions and Answers

Are there different methods for calculating ANS options for fish and game?

No. The same guidelines apply to fish stocks and game populations.

How are the fish stocks and game populations delineated for ANS determinations? How specific do the stocks and populations need to be?

AS 16.05.258(a) states that "the commissioner [of the Department of Fish and Game] shall provide recommendations to the boards concerning the stock and population identifications" and "the boards shall make identifications required under this subsection after receipt of the commissioner's recommendations."

A fish stock is defined as: "a species, subspecies, geographic grouping or other category of fish manageable as a unit" [AS 16.05.940(15)].

- A game population is defined as: "a group of game animals of a single species or subgroup manageable as a unit" [AS 16.05.940(20)].

Stocks and populations with ANS findings mostly reflect, for game, species within GMUs, and, for fish, species or groups of species within management areas. Separate ANS findings are made for each big game species, since each are managed as a unit with separate regulations (seasons, bag limits, etc.) Salmon are often treated as a single category unless regulatory attention on a species or more specific stock necessitates a more precise finding. Large categories have been used for both C&T and ANS findings, such as "other finfish" (that is, finfish other than salmon) and "marine invertebrates," reflecting the lack of management or regulatory issues at a more precise level. These findings can be revised when a management issue arises and more precision is needed.

Is the ANS intended to provide for subsistence "needs"?

No: phrasing the intent of ANS findings as providing for "subsistence needs" is misleading. The ANS is a tool for providing opportunities for Alaskans to engage in customary and traditional uses. The language of the statute reads that the boards are to "determine the amount of the harvestable portion [of the stock or population] that is reasonably necessary for subsistence uses." Further, the boards are to "adopt regulations that provide a reasonable opportunity for subsistence uses." "Reasonable opportunity" is defined as "an opportunity, as determined by the appropriate board, that allows a subsistence user to participate in a subsistence hunt or fishery that provides a normally diligent participant with a reasonable expectation of success of taking of fish or game" [AS 16.05.258(f)]. Connecting these two directives from the statute shows that the ANS is the amount that is reasonably necessary to provide a reasonable opportunity for participation in subsistence (customary and traditional) uses. The ANS is not intended to be a minimum number linked to harvests by a subset of users with low incomes to meet a bare level of survival. It is intended to reflect customary and traditional levels of harvests as documented by the best available information. The statute requires the boards to provide an opportunity for Alaskans to participate in identified C&T uses. The boards are also not obligated to provide a guarantee of achieving a harvest.

The boards may not "distinguish among subsistence users" unless the harvestable surplus is not sufficient to provide a reasonable opportunity for subsistence uses and regulations allowing all other consumptive uses have been eliminated [AS 16.05.258(b)(4)]. It is only at this point that factors such as length of use, costs of living, or monetary income come into play in defining hunting or fishing opportunity for individuals.

Is the ANS a quota for subsistence harvests?

No. ANS findings are allocations of the harvestable surplus to subsistence uses, and subsistence hunts and fisheries do not close when the subsistence harvest reaches the upper range of the ANS. Subsistence hunters and fishers may harvest, along with other hunters and fishers, the harvestable surplus above the ANS range.

If the harvestable surplus falls below the low end of the ANS range, Tier II regulations should be in effect, and the harvestable surplus becomes the quota for the subsistence harvest.

Is the ANS best as a point or a range?

Most ANS findings consist of ranges. Establishing ANS as a range best conforms to the steps outlined in the statute, and also is consistent with subsistence harvest and use patterns, which vary from year to year.

ANS findings as "points" (a single number) exist for a small number of wildlife populations. Mostly, these "point" ANS findings relate to game populations with relatively low harvestable surpluses.

When the ANS is expressed as a range, what do the lower and upper bounds mean?

- Lower bound of the ANS: if the harvestable surplus is below this number, restrictions must be placed on who may participate in the subsistence hunt or fishery, using the Tier II process. In other words, the lower bound of the ANS is the harvestable surplus number below which a Tier II hunt or fishery kicks in.
- Upper bound of the ANS: if the harvestable surplus is above this number, non-subsistence harvests may occur.
- If harvestable surplus is within the ANS range, only subsistence uses may occur, but with no restrictions on who may participate. Registration permits might be required and the hunt or fishery is subject to reasonable regulation for management purposes. This is referred to as a "Tier I hunt" or "Tier I fishery."

Can an ANS change?

Yes, the boards may change an ANS in response to a specific regulatory proposal or in the context of action on a subsistence regulation. Most examples of modified ANS findings entail more precise findings reflecting management and regulatory issues.

Are there statutory or regulatory provisions for ANS findings to be periodically reviewed and adjusted by the boards?

No. There is no set timetable for review of ANS findings. However, ANS findings are subject to review and change whenever the boards deliberate on subsistence regulations governing the fish stock or game population for which the ANS applies.

Must an ANS be made if inadequate information is available?

Few data sets are without limitations. If the board is faced with allocation decisions, department staff need to develop options based on the best available information and clearly state data limitations. Although the statute requires that ANS findings be made, no timeframe is specified. ANS findings can be reviewed and modified as better information is collected.

In certain circumstances, the boards have deferred ANS determinations to await better harvest data.

What number of years is appropriate upon which to establish the ANS options?

No fixed number of years that pertains to all ANS determinations can be established. When telling the boards what time series were chosen as options for a particular stock or population, be prepared to explain the following:

- Have use and harvest patterns changed? Suggest to the board a time series that is connected to contemporary subsistence use patterns.
- Have the demographic characteristics of communities that are associated with the C&T use pattern changed? Suggest to the board a time series that corresponds with present population levels.
- Are there anomalous years in the time series? These might include years when harvests were very low due to bad weather or unusual population movements. Explain to the board why these years are recommended to be dropped from the time series. Very high harvest level years might also be recommended to be dropped.
- Have there been restrictions on harvests within the time series? If so, the harvest data will not be indicative of what is necessary to provide a reasonable opportunity.
- Has the quality of the harvest data changed? For example, before a certain year, there may have been poor participation in harvest monitoring in local communities. If so, explain to the board that the time series for ANS determinations should begin with years when participation improved.
- The best available data should clearly indicate that the time series depicts a "natural" range of harvests.
- A minimum of 3 to 5 years of data is needed to begin to understand patterns, trends, and variations.

Should some years of low harvests be excluded when suggesting ANS options? And what about years of high harvests?

It depends. If low harvest years are part of a cycle of harvests that reflects natural variability in the stock or population or variability in subsistence harvests that reflect availability of other resources, then low years should be included when suggesting options that are based on the mean (average); these low years might not, however, be appropriate to use as the lower bound for the ANS.

If low harvests in particular years appear anomalous, perhaps due to poor reporting, unusual movements of the game population, bad weather, or an unusually poor fish return, for example, it is best to suggest they not be used in the time series for the options. Care should be taken to not omit years that depict the natural range of variation of harvests.

The same can be said for unusually high harvests: years with such harvests should not be suggested to be used for the upper bound on an ANS range.

What about populations that fluctuate widely in size (such as caribou herds)? Is it appropriate to base ANS options on a mean harvest for such populations?

Subsistence harvests traditionally vary based in part on the size of a game population or fish stock and in part on the harvest and use goals of the subsistence user. Therefore, it is probably not advisable to suggest the upper bound of the ANS be the highest-ever harvest, since this would preclude non-subsistence harvests in years of normal, but not high, abundance.

How are the options for upper and lower bounds of an ANS range calculated?

Several approaches have been used.

1. The mean harvest for a range of years, or the total harvest for a set of communities, bounded by ±25%.
2. The mean harvest for a range of years bounded by low and high harvest within the range, or the low and high harvest estimates for a set of communities based upon the 95% confidence interval.
3. The mean harvest for a range of years, or the estimated total for a set of communities, as the high end of range; and the low harvest year, or the low estimates for a set of communities based on the 95% confidence interval, as the low end of range.

Two or more of these approaches can be used to provide the board with options.

Should fish removed from commercial harvests for home use be used to calculate ANS options?

5 AAC 39.010(a) allows commercial fishers to retain fish from their lawfully taken commercial catch for "that person's own use." 5 AAC 39.130(c)(12) requires commercial fishers to include "the number or pounds of fish by species retained by a commercial fisherman that person's own use" on fish tickets at the time of delivery. This provides a data source for tracking salmon harvested for home use by commercial fishers to combine with subsistence permit or household survey records to monitor harvests in relation to ANS ranges.

With a few exceptions, salmon and other fish removed from commercial harvests have not been part of the ANS ranges established by the Board of Fisheries. For salmon, the board has used records from subsistence permits, post-season subsistence household surveys, and other household surveys to establish the ANS ranges. Division of Subsistence comprehensive household surveys have shown in that in most areas, commercial removal accounts for a relatively small portion of salmon used in local communities.

There are exceptions, however, where the board has recognized that removal of fish from commercial harvests for home use is significant for local communities, and if commercial opportunities were curtailed, harvests occurring under a subsistence permit program would likely increase above previous levels.

Should rod and reel harvests be counted when options for an ANS range for fish are presented?

The answer will vary by stock. ANS ranges pertain to subsistence (customary and traditional) uses. Sport fishing is defined in statute [AS 15.05.940(31)] as "the taking of or attempting to take for personal use, and not for sale or barter, any fresh water, marine, or anadromous fish by hook and line held in the hand, or by hook and line with the line attached to a pole or rod which is held in the hand or closely attended, or by other means defined by the Board of Fisheries."

5 AAC 01.010 lists legal types of gear for subsistence fishing, subject to modification in specific regulations: "unless otherwise provided in this chapter." 5 AAC 01.010(g) states that "subsistence fishing by the use of a hook and line attached to a rod or pole is prohibited, unless otherwise provided in this chapter." Exceptions generally pertain to ice fishing.

In many areas of the state, rod and reel harvests account for a small portion of the salmon harvest for home use (Copper Basin, Cook Inlet, Kodiak, Bristol Bay, Chignik). However, in some other areas, rod and reel accounts for a significant portion of home use harvests. This is also the case in Southeast Alaska. Because of the importance of rod and reel as a gear type for taking salmon for subsistence uses in the Kuskokwim Area, Yukon Area, and portions of the Norton Sound Area, subsistence regulations for these areas allow rod and reel as a subsistence gear. The Federal Subsistence Board has generally authorized rod and reel as legal subsistence gear.

Generally, rod and reel harvests by local community residents have been included by the board in ANS findings for fish other than salmon if the harvest is for customary and traditional uses.

In summary, C&T and ANS findings should be based on the best and most complete information that describes a pattern of use. It is appropriate to include harvests that occur with rod and reel or from commercial removal as long as the origin of the fish (harvest by gear type) is clearly presented. The historical background on use of various kinds of gear should also be included so that the board has complete information about historical and contemporary harvest methods.

Should all harvests by all Alaskans be included in the ANS range options? If not, how is it determined which harvests by Alaskans to include?

In preparing ANS options and assembling harvest data, the department should present all harvest data for Alaska residents. Harvests by local communities (because they established the C&T pattern) should be separated out from harvests by "other Alaska residents" to provide the boards with the data necessary to limit the ANS range to harvests by certain segments of the user population, if these choose to do so. It is up to each board, however, to decide to exclude some portion of Alaskans' harvests from an ANS finding and to develop justification for doing so.

How to distinguish between subsistence and other uses by Alaskans has been a difficult aspect of ANS findings for some wildlife populations, especially in recent years. For some game populations off the road system, "local harvests" and some portion of nonlocal harvests (or no non-local harvests) have been used as the basis for the ANS, due to assumptions about the lack of efficiency of the harvest by those traveling long distances or by airline to hunt.

Whether or not to include known harvests by "other Alaska residents" (that is, Alaskans not living in the communities that established the C&T pattern or not living in the regulatory area)

has not been an issue for salmon. The Board of Fisheries has examined the range of harvests by Alaskans participating in a fishery as reflected in subsistence permit records or other similar data. It has not excluded "non-local harvests" from the ANS. In this approach, every Alaska resident participating in the subsistence fishery is engaged in a subsistence use.

Filling in the gaps: how are harvest estimates developed in the absence of data?

If particular communities are missing from a time series or set of survey data, there are 2 options for filling the gap:

1. Chose another, similar community as a surrogate. Use the per capita harvest value for that surrogate community to calculate a harvest estimate based on the community's most recent population estimate.
2. Use the mean per capita harvest estimate for all known communities and apply it to the community's most recent population estimate to calculate a harvest estimate. This approach is appropriate when no one community is an appropriate surrogate.

Always be explicit in how calculations are done for filling in gaps. If at all possible, gaps should be filled using one of the above methods so that coverage within the ANS option is complete (so that the ANS is not too low).

An ANS should not be established in the absence of data. If no harvest data are available, the ANS determination should be postponed until from 3 to 5 years of data are collected.

Should means and bounds in ANS options be rounded?

Generally, yes. Not rounding suggests an inappropriate level of precision in the harvest estimates.

<u>Procedures for developing ANS options</u>

Reminder: The department develops ANS options for the boards. The boards make the final ANS determinations and may use information in addition to that included in ADF&G background documents. The goal of staff reports is to establish a good administrative record as background for the ANS finding.

1. Identifying the stock or population for the ANS finding.

Stock and population identifications should be done in consultation with the Division of Wildlife Conservation for game populations and with the divisions of Commercial Fisheries and Sport Fisheries for fish stocks. Stocks and populations that are subject to an ANS finding should have a uniform regulatory structure that reflects their manageability as a unit (the statutory definition of a stock or population). Stocks and populations that have a single ANS should ideally also have uniform C&T use patterns.

Nevertheless, many ANS findings combine multiple species and/or multiple management units. Examples include findings for "non-salmon finfish," "marine invertebrates," and numerous statewide furbearer populations. These should be viewed as interim ANS findings that meet the requirements of AS 16.05.258(b); these findings can be refined when management issues warrant more precision.

2. Compiling the harvest data.

There are **2 basic approaches** to establishing options for ANS ranges. One relies on having a reliable time series of harvest data available, generally based on harvest tickets, permits, or annual surveys. The second approach is used when harvest estimates for only a single year (or just a few years) are available, usually based on comprehensive household surveys conducted by the Division of Subsistence. These two approaches can be used in combination if one works best for certain segments of the user population and another for other segments. For example, time series data may be reliable for some but not all local communities, in which cases household survey data for a single study year may need to be used to compensate.

Condition A. Adequate time series data are available.

- Prepare a table that summarizes the available harvest data by year. Include as many years as are available in the worksheet. If available, separate out "local" harvests from "other Alaska residents" harvests in columns; a third column should have the total Alaska resident harvests; always remove non-residents from harvest estimates.

- Guidance for deciding how "local" will be defined for the table. Base the list of local communities on the set of communities or areas covered in the C&T findings. Which communities established the C&T pattern of use and were the basis of the information summarized in the C&T worksheet? Which communities have efficient access to the resource (Criterion 3 of the Eight Criteria)?

- Decide on how many years, and which years, to use to establish the mean harvest; consider a range of years that encompasses cycles and reflects the "current" situation (demographic characteristics, for example); document how this decision was arrived at.

- Identify years for which data limitations exist (that might result from poor sampling, for example); document any years excluded from further analysis, and the reason for that exclusion.

- Identify any other data limitations, such as communities that are systematically missing from the harvest data; develop estimates for missing communities by using values for surrogate communities or by using other data sources; document all decisions.

- Recommend a range of years upon which to base the ANS. This range of years should reflect recent demographic and socioeconomic conditions as well as current harvestable surplus of the stock or population (or a range of harvestable surpluses); document the reasons for exceptions.

- Identify and document years within this time series that are anomalous due to unusual hunt or fishery conditions, or other factors, and that should not be part of the ANS options.

- Include the mean harvest for the recommended time series as the bottom line in the table.

Condition B. Adequate time series data are lacking.

- Develop a table with estimated harvests for the stock or population based on Division of Subsistence household surveys for local communities; use the per capita harvest estimate and multiply by the most recent population estimate for the community to develop a harvest estimate.

- For communities for which household harvest survey data are not available, select a similar community as a surrogate and use that community's per capita value to calculate a harvest estimate. An alternative is to use the mean for all known communities, if there is no appropriate surrogate community; document which approach was used and why.

- If more than one survey estimate is available for a community, choose the most recent one or develop an average for the study years; document which approach was used and why.

- The table can also report low and high estimate for each community based on the 95% confidence interval.

- Add the estimates together; this is the estimate of local harvests.

- For non-local game harvests, harvest ticket data will need to suffice, because household survey data will not be available.

If no reliable harvest data are available, the department should recommend that an ANS determination be postponed until a harvest data series is established; 3 to 5 years of data is the minimum needed.

<u>Preparing options for the ANS range</u>

A. Usual choices, if a time series is available:

1. Calculate the mean for the time series; bracket the mean by a fixed percentage (25% has been used frequently) to determine the ANS range.
2. Use the low estimate and the high estimate as the bounds.
3. Use the low estimate and the mean as the bounds.

B. Usual choices, if available data are household harvest surveys and limited study years:

1. Add estimated harvests for each local community; bracket the estimate by a fixed percentage (25% has been used frequently) to determine the ANS range.

2. Add the low and high estimates for each community (based on the 95% CI) and use these sums as the bounds for the ANS.
3. Provide an estimate of non-local harvests (based on harvest ticket or permit time series) and add it to the local harvest estimate.

Two or more methods can be used to present options.

NOTE: there might be some situations where a point ANS finding is appropriate, but these will be rare. These might include game populations with very low harvest levels (mountain goats in some GMUs might be an example).

Final Step: Following the board action on the ANS finding, staff should write a brief synopsis of the finding and the discussion on the record that led up to the finding. Note any information that shaped the finding that was not included in the staff options and also note major topics of discussion, issues, and points of contention.

Summary of Steps to Follow in Preparing Background Information and Options for Board of Fisheries and Board of Game "Amount Reasonably Necessary for Subsistence" (ANS) Findings [Implementing AS 16.05.258(b)]

Division of Subsistence
Alaska Department of Fish and Game
October 2021

Preliminary Considerations

- A positive "customary and traditional use" (C&T) determination for the game population or fish stock must be in place before the boards proceed with an ANS finding [AS 16.05.258 (a) & (b)].

- An ANS determination is only made for stocks and populations for which a harvestable surplus exists.

- Clearly document data sources and data limitations.

- Two or more options can be established, clearly document the differences between options.

- In all cases, final ANS determinations are made by the Board of Fisheries and the Board of Game. The boards may consider information in addition to that provided by the department in establishing the ANS ranges. The goal of the department is to provide a good administrative record of harvests and other considerations as background for ANS options.

1. Define the fish stock or game population.

- This should be done in consultation with the Division of Wildlife Conservation for game and the Divisions of Commercial Fisheries and Sport Fish for fish.
- Stocks and populations "are manageable as a unit" and have a uniform regulatory structure.

2. Compile harvest data

Organize a table with harvest data.

If a reliable time series is available from harvest tickets, permits, or household surveys:

- The table should include all years for which data are available.
- The table should break out harvests into 3 columns if data are available: harvests by local residents, harvests by other Alaskans, and total harvests by all Alaskans. Always exclude non-resident harvests from the table.

- Identify and document years for which data limitations exist (that might result from poor sampling, for example); recommend years to exclude from further analysis.
- Identify and document any other data limitations, such as communities that are systematically missing from the harvest data; develop estimates for missing communities by using values for surrogate communities or by using other data sources.
- Recommend a range of years upon which to base the ANS. This range of years should reflect recent demographic and socioeconomic conditions as well as the current harvestable surplus of the stock or population (or a range of harvestable surpluses).
- Identify years within this time series that are anomalous due to unusual hunt or fishery conditions or other factors and that should not be part of the ANS calculation.
- Include the mean harvest for the recommended time series as the bottom line in the table.

If a reliable time series from harvest tickets, permits, or surveys is not available:

- Develop a table with estimated harvests for the stock or population based on Division of Subsistence household surveys for local communities (or another similar source):
  - Use the per capita harvest estimate and multiply by the most recent population estimate for the community to develop a harvest estimate; or
  - For communities for which household harvest survey data are not available, select a similar community as a surrogate and use that community's per capita value to calculate a harvest estimate; or
  - An alternative is to use the mean for all known communities, if there is no appropriate surrogate community.
  - If more than one survey estimate is available for a community, choose the most recent one or develop an average for the study years.
  - The table can also report a low and high estimate for each community based on the 95% confidence interval.
- Add the estimates together; this is the estimate of local harvests.
- For non-local game harvests, harvest ticket data will need to suffice, because household survey data will not be available.

If no reliable harvest data are available, the department should recommend that an ANS determination be postponed until a harvest data series is established; 3 to 5 years of data is the minimum needed to begin to understand patterns and trends.

The board chooses the harvest data set to use–i.e., whether it uses harvests by all Alaskans, local residents, and some non-local residents, or just local residents.

3. Prepare options for ANS range

A. Options, if a time series is available, include:

1. Calculate the mean for the time series; bracket the mean by a fixed percentage (25% has been used frequently) to determine the ANS range; or,
2. Use the low estimate and the high estimate within the range as the bounds; or,
3. Use the low estimate and the mean as the bounds.

B. Options, if ANS to be based on household harvest surveys and limited study years:

1. Add estimated harvests for each local community; bracket the estimate by a fixed percentage (25% has been used frequently) to determine the ANS range; or,
2. Add the low and high estimates for each community (based on the 95% CI) and use these sums as the bounds for the ANS; also,
3. Provide an estimate of non-local harvests (based on harvest ticket or permit time series) and add it to the local harvest estimate

Two or more methods can be used to present options.

4. Steps to take following the board action:

Write a short synopsis of board actions. Include:

- Date
- Final action
- Differences from staff options, if any, and reasons for modifications
- Any other major discussion points